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TEENY TINI HAS BIG POTENTIAL

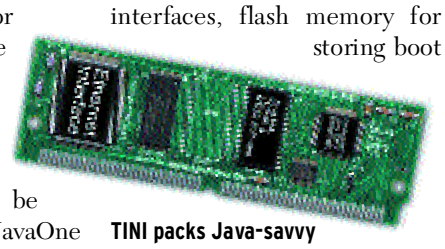
SIMM-SIZED JAVA PROCESSOR EMBEDS WEB ACCESS

BY EDWARD J. CORREIA

While Sun Microsystems Inc. is taking care of the software side fulfilling its "Java everywhere" vision, an equal task faces hardware companies. Chip maker Dallas Semiconductor Corp. has answered the call with the Tiny Internet Interface, or TINI, a SIMM-sized Java processor for embedded applications set to be released at next week's JavaOne conference in San Francisco.

TINI (www.ibutton.com) gives Java developers an Internet-ready target for their embedded applications, according to Stephen Curry, director of software engineering at Dallas Semiconductor. "TINI is distinctive for its programmability in Java," and for its ability to communicate natively via TCP/IP or the Point-to-Point Protocol (PPP), he said.

TINI is equipped with a microcontroller to handle I/O interfaces, flash memory for storing boot instructions and other firmware, and a 10Mbps Ethernet controller, all on a standard 72-pin SIMM board measuring 1.25 inches high by 3.5 inches long. TINI will be available with



TINI packs Java-savvy networking into a 72-pin package.

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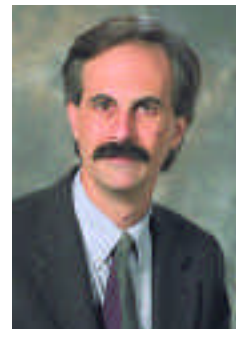
IBM's DB2 Takes On E-Business

Major upgrade provides support for XML, Oracle database queries

BY ALAN ZEICHICK

IBM Corp. has focused is efforts on becoming the preeminent software and service provider for e-business, but one of the company's weak points has been in e-business database software. While other vendors' database software has embraced XML, for example, IBM's DB2 Universal Database 6.*x* has supported the Extensible Markup Language only as an extension of the "text" data type. But that's all changing with the forthcoming release of DB2 Universal Database 7.1, currently in beta, and with some platforms due to begin shipping this month.

According to Jeff Jones, senior program manager for IBM's Data Management Solutions division, many of the improvements that make up DB2 7.1 are to add better e-business capabilities. He also emphasized DB2's enhanced data integration across multiple platforms, better support for Windows 2000, and more flexibility and interoperability with stored procedures.



XML is a native data type in 7.1, according to IBM's Jones.

Improvements to DB2's XML capabilities take the form of an XML extender. "In DB2 6.1, the text extender was XML-aware," explained Jones, "but for version 7, XML is a native data type which can build columns and tables based on the contents of an XML file." The XML extender actually shipped in December 1999 as a free download and plug-in for DB2 6.1, he said, but now it's included with DB2 7.1.

Jones added that the XML functionality goes beyond merely mapping XML to DB2's tables, thanks to a currently proprietary feature called DAD, or data access definition. The DAD

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Java on the Client: Alive and Kicking

Standard Edition 1.3 tuned for performance, deployment options

BY DAVID RUBINSTEIN

Java 2 Standard Edition is alive and kicking on the client side, and has been ratcheted up for increased performance and improved deployment-based options for people running typical desktop applications, according to Blake Connell, Sun Microsystems Inc.'s product line manager for J2SE.

"With this release, we're trying to come out strong," Connell said, as the platform approaches its fifth year. "We think we're feature-complete for the most part, and we wanted to emphasize performance."

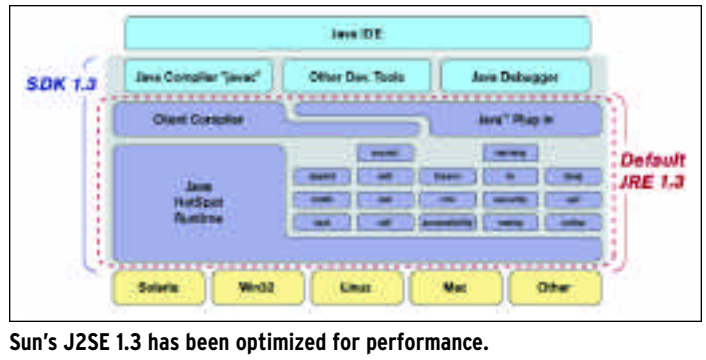
To feed the need for speed, Connell said, Sun's Java HotSpot virtual machine has been optimized to provide quicker start-up time for applets and reduced memory requirements for Java applications and applets. Also, Connell said, the libraries throughout the platform have been pared down, as have the Java foundation classes, including GUI and Swing components.

Connell cited in-house benchmarks that showed 40 percent better start-up times and 25 percent reduction in memory footprints with Swing-based applications and applets.

For deployment, J2SE has been outfitted with Java Plug-in as part of the run-time environment, which serves as a bridge between a browser and the JVM, Connell explained. This provides the ability to store, or cache, applets locally, he said. Some versioning functionality has been included to alert users to application updates, he added.

The Java Plug-in also allows for the extension of J2SE for segment-specific areas, Connell

▸ continued on page 38



Sun's J2SE 1.3 has been optimized for performance.

JDOM PROJECT SEEKS TO FIND MIDDLE GROUND FOR DEVELOPERS

BY DOUGLAS FINLAY

Java programmers building XML applications could find themselves between a rock and a hard place.

Many developers build their Java-based XML applications using the Document Object Model (DOM). According to the founders of the Java Document Object Model (JDOM) Project, the memory-intensive nature and treelike structures of the DOM can become an albatross around developers' necks. This might hasten enterprise migration toward the Simple API for XML (SAX) to speed up the programming process. But JDOM's backers have reservations about SAX as well because it requires sequential callbacks.

▸ continued on page 38

David Warthen, Chief Technology Officer, **Ask Jeeves**

"One of our biggest challenges was to take something that's really hard to build – natural language Web querying – and disguise the complexities to make it easy to use."

"In the past, we were focused on developing the core question-answering technology."

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The Business Internet

"It's a big advantage to be able to draw off the Microsoft Visual Studio tools, and in particular, the way XML has been embraced to make development much easier and faster."

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MANAGING COMPONENT RE-USE

New Flashline tool to organize code chunks

BY DAVID RUBINSTEIN

A new development tool released last week will widen the scope of programmers from beyond their workstations to a global development environment with resources that have never been available in an integrated development environment (IDE) before, according to Flashline.com Inc. CEO Charles Stack.

Flashline's tool, Component Manager, works in five tiers, giving developers assistance from the language level up to requests for custom components, and offers help and testing each step of the way, Stack said.

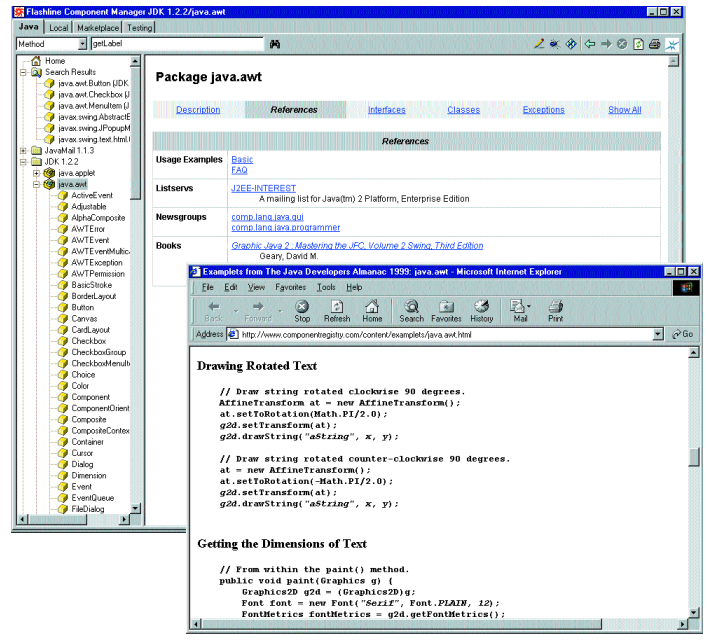
"People say that component development is the right idea," Stack said. "Well, it's been the right idea for a long time. Now, the architecture [Java 2 platform] and the language are in place for it to become a reality."

At the first tier, Component Manager provides developers with research into classes, methods and whole language constructs within the context of Java, explained Flashline chief technical officer Gary Baney. Developers can get descriptions of the language and methods, as well as use reference materials, learn about appropriate APIs and classes, and find code samples.

The second tier shows the availability of re-use on the local system by going through the class path, parsing it out and identifying the locations of all components on that local system. Tier three, Baney said, enables re-use across the enterprise or development group, searching all the class paths for components.

"Developers want to know who used [the component] and what they thought about it," Stack said. "No one's included that in a repository yet."

If the developer can't find the component, tier four takes them to Flashline's Web site, where components are available for sale. And if the component needed isn't there, the tool links to Flashline's Components By Design area, where someone can post a custom project to be built and developers can bid on it.


Flashline Component Manager JDK 1.2.2/java.awt
Package java.awt
Examples from The Java Developers Almanac 1999: java.awt - Microsoft Internet Explorer
Drawing Rotated Text
Getting the Dimensions of Text

Flashline's Component Manager helps developers research Java classes, methods and language constructs, as well as find usable code samples.

All of this, Stack said, is integrated within the IDE, so that when developers need documentation or resources during development, they can find it within the context of where they are in the project, ending the frustration of wading through mounds of unnecessary information and quickening time-to-market, Stack said.

The fifth tier is testing, which is done in conjunction with Flashline's Quality Assurance Lab, a dedicated service that provides three levels of testing: code review, where design and adherence to Java specifications are measured; efficiency, where the code is looked at method-by-method and a graphical color report is produced; and load testing, which is performed on Enterprise JavaBeans and scaled to the need of the user, Baney said.

Component Manager was to be made available May 22, except for the enterprise tier, which should be released by late summer, Stack said. It is free and available at www.flashline.com. Component Manager is written in C++ and Java, and supports four integrated development environments: IBM's Visual Age, Inprise/Borland's JBuilder, Sun Microsystem's Forte and WebGain's VisualCafé. ▮

AccuSoft Updates Graphics Toolkit, Plug-Ins

Focus is on providing tools to corporate developers

BY ALAN ZEICHICK

AccuSoft Corp., a developer of graphics libraries and utilities, has released a beta of its enhanced ImageGear toolkit with new functions and formats, as well as created a new professional services group to provide consulting to corporate application developers.

The new version of the Windows-based graphics toolkit, called ImageGear 2000, will replace version 8.1. The upgrade, according to AccuSoft, includes improved filter optimizations for JPEG, PNG, G3/G4 and TIFF; faster rotation and resize functions; and new GUI imaging dialog boxes for rapid application development. The company also has created new code samples demonstrating how to use ImageGear 2000 for Web development using VBScript, JavaScript, ASP and Java, as well as new sample code for Visual Basic and Delphi. In addition, the product includes a Java Native Interface (JNI) for using its DLLs with Java.

Along with the update to ImageGear, AccuSoft is developing three new plug-ins for the toolkit, focused on common graphics formats. The PDF plug-in allows ImageGear to load three additional formats—Adobe portable document format (PDF), PostScript (PS) and Encapsulated PostScript (EPS)—and to output images as PDF files. AccuSoft's PDF plug-in is integrated quickly via existing APIs into various ImageGear applications, according to the company.

The other two plug-ins focus on providing graphics-file compression. The Wavelet plug-in is claimed to provide image compression up to 100-to-1 without any visually detectable loss of image quality in both color and grayscale images. The JBIG2 plug-in uses the new JBIG2 file format, currently an ISO draft (WD14492); the company claims that this format delivers twice the compression of the common Group IV TIFF format, and says it's especially effective on black-and-white documents.

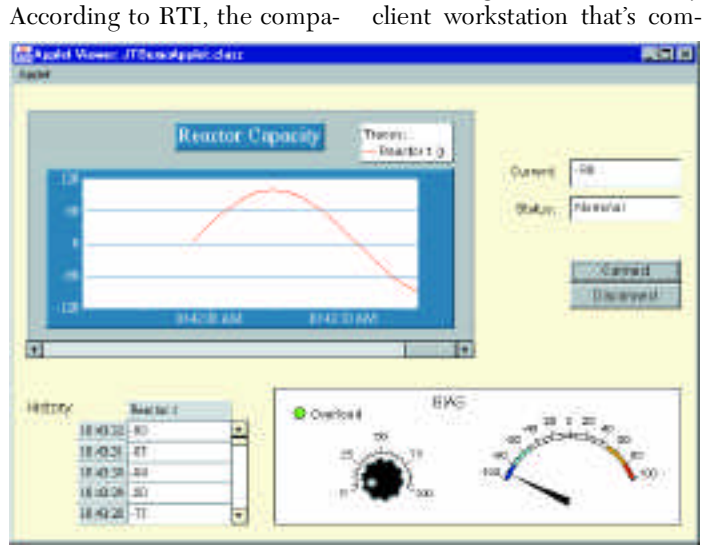
The betas of ImageGear 2000 and of the three plug-ins are currently available from AccuSoft's Web site (www.accusoft.com). All are expected to be generally available by July 1, according to Peter Weinrobe, AccuSoft's vice president of sales and marketing. ImageGear's price will remain the same, at $1,995. The WaveLet and JBIG2 plug-ins will be priced at $7,495, and the PDF plug-in will be priced at $3,995.

In April, AccuSoft created a Professional Services software development and consulting group that corporate developers can use to outsource custom imaging software development or as consultants. "Our Professional Services group is dedicated to building long-term, trusting partnerships that provide customer satisfaction on every level while delivering powerful solutions on-time and on-budget," said Colleen Rolph, manager of the company's Professional Services Group. ▮

RTI ADDS JAVA INTERFACE TO NETACQUIRE

Point…click…and measure? That's the goal of Real Time Integration Inc., which manufactures the NetAcquire line of network-based data acquisition and control servers. According to RTI, the company's new NetAcquire Java Toolkit provides more options for controlling the NetAcquire instrumentation.

The NetAcquire Java Tool kit is designed to run on any client workstation that's compliant with Sun's Java 1.1 specification. According to RTI (www.realtimeint.com), the Java file for a completed applet can be uploaded to an integrated Web server inside a NetAcquire server, making the Java applet immediately available across the enterprise. The Java applet does not need to be installed on each client computer, says the company, and runs automatically from existing Web browsers.



RTI's Java Toolkit provides GUI and functional tools for data acquisition.

RTI's technical specifications for the Java Toolkit show that it interfaces to third-party JavaBean class libraries, including those from KL Group and ErgoTech Systems, and works with JavaBean-compatible development suites, such as WebGain's VisualCafé. The NetAcquire Java Toolkit is priced at $495. ▮

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Persistence Moves Into Caching

Dynamai allows developers to publish events to server cache

BY REBECCA ROHAN

Caching static Web content was good enough when Web sites were dishing out the same old thing, like a mom-and-pop ice-cream store does. Customers came in, looked at the menu, and most of them ordered from the few tubs of ice cream in the stash behind the front counter—tubs that were brought out from the back by popular demand. Most customers didn't have to wait for a server to rummage through the walk-in freezer, and the server was quickly freed up to help other customers with their requests. Unless somebody came in asking for low-demand flavors like Chili Marshmallow Swirl, the line moved quickly.

Caching not only saves time and improves customer satisfaction, but with Web sites it saves money, too, because it helps sites ride out traffic peaks without investing in as much additional hardware as they would otherwise have had to. But the model of serving a finite number of frozen HTML pages is melting away, as dynamic-content technologies such as Java Servlets, Active Server Pages and Java Server Pages are creating environments that are more like build-your-own-sundae bars or flea markets. With dynamic pages, customers can sell to each other, use real-time auctions where they can compete for items, and join instant buying groups in which cooperation among buyers serves to lower the price.

How do you cache the kinds of content generated by those users—without taking the risk that the data might become out of date? Persistence Software Inc., known for its PowerTier line of caching products, thinks it has the solution with Dynamai, a dynamic cache product.

Dynamai complements the PowerTier product line but doesn't require it. What Dynamai requires is developer involvement to publish the events, such as new bids, that should trigger a comparison to the contents of the cache and invalidate the older information.

"There are a couple of mechanisms a developer could use to publish events," said Jim Barton, vice president and chief technical officer of Persistence (www.persistence.com). "They can create the cache configuration file so the cache can intercept incoming requests and publish events based on those requests," said Barton.

Dynamai supports Microsoft's COM, Sun's JavaBeans and has XML interfaces so the developer can communicate with external applications.

"From any environment, developers can create XML events," said Barton. "We publish an XML vocabulary that allows you to create your own events and then send those to the Dynamai cache via a standard HTTP request. Developers in any language, in any environment, can interact with the Dynamai cache." Dynamai also supports a basic time-based content-expiration model, along with HTTP request, and arbitrary system event models.

Dynamai's pricing starts at $25,000, but management consulting firm R. B. Webber & Co. Inc. (www.rbwebber.com) projects a 1,052 percent return on investment for a site that currently delivers 5 to 10 requests per second on an average day. Caching is a strong tool, they say, for handling peak traffic overload.

According to Webber, whose calculations were based on 10-times overload protection, handling that traffic level would require two Dynamai servers, as opposed to nearly 20 additional servers without Dynamai.

Early Dynamai customers include iPIX, which is expected to save more than $2.5 million over the next three years while increasing capacity by a factor of three. Web sites that cache dynamic content correctly can enjoy on-the-fly overload protection, while end users get the speed benefit of information preassembled in the caching layer instead of buried in the database management layer. ▮

Microsoft Unveils Final SQL Server 2000 Beta

Data mining, XML functionality new features in second trial release

In anticipation of a formal summer debut for its SQL Server 2000, Microsoft has released its final beta version, Beta 2, of the Windows-based database software in full disclosure to more than 20,000 users. According to the company, the second beta edition features a number of enhancements that build on the robust feature set of Beta 1, which was introduced in November 1999.

Perhaps the most significant change, said Jeff Ressler, Microsoft's lead product manager for SQL Server 2000, is that the second beta adds functionality to SQL Server's data mining feature, enabling developers to analyze data in relational fields and OLAP cubes and draw trends from the data, such as predicting who will be a good or bad credit risk, or to pinpoint clusters of customers who would be most likely to purchase a specific product.

New XML enhancements provide fuller communication among diverse applications. XML support now includes a Transact-SQL (T-SQL) OpenXML clause for building a result set from data stored in the XML document. Ressler said developers could extract data from an XML document and insert it into relational tables. He also said Beta 2 supports X-Path queries and XML data scheme usage to map relational columns to XML documents.

A debugger within the Query Analyzer now provides for debugging without the need to load Visual Studio. Further, the Analyzer includes templates that can be used as starting points for creating objects such as databases, tables, views and stored procedures.

In addition, Data Transformation Service enhancements include a multiphase data dump to enable developers to control or customize data as it's being transported. Beta 1 provided only for manipulation of data at input and output operations, Ressler said.

Adding to SQL Server 2000 scalability features, Ressler said, Beta 2 enhances distributed partitioned views by permitting developers to horizontally partition tables across several servers, and to define a distributed partitioned view on each member server. He said this makes it appear as though a full copy of the original table is stored on each server.

SQL Server 2000 Beta 2 expands memory support up to 64GB, while its distributed queries support the OLE DB Provider for Exchange and the OLE DB Provider for Active Directory.

Information on obtaining SQL Server 2000 Beta 2 Enterprise, Standard and Personal editions is available at www.microsoft.com/sql. A shipping charge of $9.95 covers shipment of 2 CDs. ▮

CODE INSPECTION AT YOUR SERVICE

Reasoning's Web-based InstantQA provides review each step of the way

BY ALAN ZEICHICK

"We think there's a better way to write software!" According to Dave Jones, president and CEO of Reasoning Inc., the biggest problem with software development today is the lack of quality assurance (QA). Testing applications after they're written or deployed doesn't work; the answer, he believes, is not purely in the world of standard test-case-based quality assurance, but in the old-fashioned practice of code review during the development process. And that's just the service that his company is now offering through its InstantQA Web-based offering.

InstantQA is a service that inspects C, C++, Java or COBOL source code. Code is submitted to Reasoning over the Web, as often as is desired. "It doesn't have to be a complete application," said Scott Trappe, senior vice president and general manager of the service. As long as a module compiles, it can be tested, though the more code that's completed, the more comprehensive the testing will be.

The process, said Trappe, is simple. The source code is uploaded to the InstantQA server, where it is parsed and stored in a code-management system. Reasoning's software builds a data-flow graph of the code and identifies areas in the code where structural-level errors might occur. The analysis software then backtracks through the code to determine if any possible path might result in such an error.

At present, Jones said, the first-level output from the InstantQA software is a database of all possible errors in the code. This output is then reviewed by Reasoning's on-staff code analysts, who determine which errors are real. Only the real errors are given to the customer as a final report. "With other tools, there are too many false positives," claimed Jones, arguing that if developers spend too much time tracking down nonexistent bugs, they'll derive less value from the InstantQA reports—or stop using them altogether.

The company is targeting a 24-hour turnaround from source-code submission to the final report.

Reasoning's goals include upgrading its expert system and heuristics database, to eliminate most or all of the manual error-review state. "If we're going to roll this out to every programmer on the planet, it has to be automated," said Jones.

The InstantQA service is currently available as a subscription-based service, costing approximately 10 cents per line of reviewed code. One pricing example he gave showed that 100,000 lines of code, reviewed four times for a project, would cost $36,000 to review. However, the company recommends testing code more often—as often as once per test build.

The right time, according to Trappe, is after each build is written, but before it is handed off to a company's own QA staff. Let InstantQA find the structural errors that will crash the code, said Trappe, and let your company's testers concentrate on functional testing.

The InstantQA service is available from www.reasoning.com. ▮

Coming Clean on SOAP Specification

IBM releases tools for messaging implementation; W3C gets a look

BY DAVID RUBINSTEIN

IBM Corp. has strengthened its commitment to the Simple Object Access Protocol (SOAP) with the release of SOAP4J, a tool set for generating, interpreting and responding to SOAP messages in Java.

Big Blue's tools come on the heels of the release of version 1.1 of the SOAP specification, co-authored by IBM and its subsidiary Lotus Development Corp., as well as DevelopMentor Inc., Microsoft Corp. and UserLand Software Inc. SOAP is an interoperability protocol that uses XML to provide a common messaging format to link applications and services via the Web. IBM posted source code and tools based on the 1.1 release on April 28 (www.alphaworks.ibm.com/tech/soap4j) and claims that three days later, it was being downloaded once every two minutes.

IBM's Sutor senses excitement around the SOAP idea.

"We find there is a lot of acceptance and excitement around this," said Robert Sutor, program director for XML technology at IBM. "We want much wider participation."

To that end, IBM and the other authors are lobbying hard to have SOAP accepted as an industry standard. On May 9, the co-authors submitted SOAP to the W3C, which is hosting a mailing list to discuss a broad range of XML protocols.

According to Janet Daly of the W3C, the standards body has acknowledged receipt of the modified specification and should assign a staff contact to review it within the next four weeks.

Unlike others who submit specs to the W3C, "in the case of SOAP, the submitters were clear about what they want to see happen with it," Daly said, which is an acceptance of the spec as a standard without much change.

Daly said SOAP was to be reviewed at two W3C events; an XML protocol "shakedown" May 16, and an advisory committee meeting May 23 to determine what the W3C's role should be in the development of SOAP. Sutor said the W3C wants to look at XML protocols, and that IBM "likes to get involved with open standards bodies" to promote industrywide acceptance of technologies.

"SOAP is only one approach" to XML interoperability, Daly said, adding that the W3C is taking a broad look at various XML submissions.

Before getting to the point of submitting the spec to the standards body, Sutor said, some modifications to the original Microsoft offering had to be made. Until now, SOAP has been restricted to use on the Web, Sutor explained, and expanding its use to e-mail and MQSeries messaging middleware was among four significant changes from version 1.0 of the specification. Also, Sutor said, the team wanted to make sure that SOAP is built on W3C standards.

Other changes were to alter the orientation, which "was reminiscent of using the Microsoft programming model [DCOM]," Sutor said.

"A study said that 70 percent of the Fortune 1,000 companies use three or more systems as servers, so it had to be neutral. That's why SOAP is built on XML," he said, citing the need for interoperability among those systems. ■

Bluestone Adds JSP to UBS 7

What's new in Bluestone Software Inc.'s Universal Business Server update? According to the company, version 7's hottest new feature is its support for Java Server Pages (JSP), Sun's Java-based specification for dynamic Web pages.

UBS 7.0 also will enable Enterprise JavaBean application developers to launch new EJB apps in addition to regular JavaBean apps, said John Capobianco, senior vice president and chief marketing officer of Bluestone (www.bluestone.com).

According to Capobianco, UBS's JSP 1.1 support will allow less-technical programmers to develop complex applications. "If there are 50,000 to 100,000 programmers that can write to EJBs, there are millions of departmental programmers that can solve business problems by tying together heavy-duty object EJB and regular JavaBean applications at the back end by using the JSP scripting language."

He said programmers would not need to rewrite object modules such as EJBs and JavaBeans, but instead tie them together in strings and lay them out in JSP. UBS also runs Java applications conforming to Sun's Java 2EE specification.

A popular feature of the Universal Business Server for XML programmers, said Capobianco, is its ability to use the Extensible Stylesheet Language (XSL) to translate XML code into various formats. "Once JSP gets information in XML, XSL can send a request from Internet Explorer 5 in XML, or translate a request from Netscape 4.0 and send it in HTML, or translate a request from a cell phone and send it in Wireless Markup Language."

Pricing for version 7 starts at $25,000. As a foundation for its Total e-Business (TeB) platform, utilizing the Sapphire/Web application server, prices start at $100K.■

MKS ADHERES TO PRETZEL LOGIC

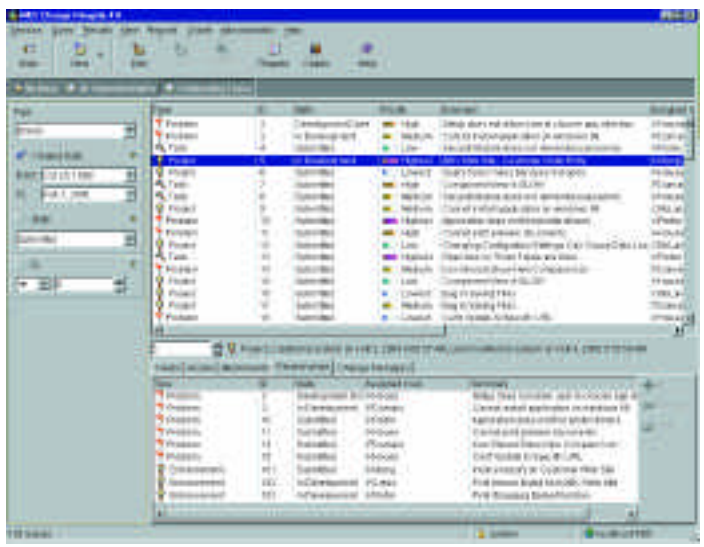
Outsourcing integration to broaden change management reach

BY EDWARD J. CORREIA

Mortice Kern Systems Inc. (MKS), a maker of code and content management software, has partnered with Pretzel Logic Software Inc. to integrate MKS solutions with a greater number of off-the-shelf tools.

MKS develops and markets Source Integrity Professional, which adds document tracking capabilities to development environments like Microsoft's Visual Studio or WebGain's VisualCafé, which can help to manage large projects. Pretzel Logic specializes in making software from different companies work together and has agreed to integrate Source Integrity Professional with Web applications StoryServer from Vignette Corp. and MediaSurface from Mediasurface Ltd.

"The biggest reason for introducing a management system is to eliminate the concern of collisions," said Ellyn Winters-Robinson, director of corporate marketing for MKS (www.mks.com), who spoke about the dangers of overwriting another person's files. "When you're dealing with source code, what may seem like a logical change to one person may introduce a bug in somebody else's work."



MKS Change Integrity works with other programs to help manage changes.

Although MKS has done much of its own integration in the past, it hopes the partnership will help the company expand its market. "There are only so many integrations that a vendor can do," said Winters-Robinson. "For every customer deal that comes in, there's some different integration that is demanded. And we want to satisfy our customers," which consist mostly of the IT departments of Fortune 500 companies. So partnering with Pretzel Logic enables the company to integrate the tool sets more quickly and efficiently, she said. As part of the agreement, Pretzel Logic also will be called upon for future integrations.

The MKS solution unites diverse team members under a common system, said Winters-Robinson.

MKS is finding customers where it had not before, Winters-Robinson said. With the advent of the Internet and Web development, she said, development teams now include more than just code writers, and testing and quality-assurance people. "You may now also have graphic designers and copywriters that happen to be collaborating on a Web site, nontechnical contributors working in Front Page or Word." The MKS solution knits together all these team members under a common management system providing work flow, an audit trail and collecting meta information on documents, she said. Everyone would check in their work through the MKS management system, which gathers information about who the person is and when and why he or she is making the change.

"It comes down to quality assurance. In the Internet age, staying in control, knowing who's doing what, and why, is really important," Winters-Robinson said. "It means that you've got your house in order and you can move fast." ■

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KYLIX PROJECT ENTERS HOME STRETCH

Inprise selects Troll Tech's GUI application framework for Linux RAD

BY EDWARD J. CORREIA

Linux programmers may soon add Borland-brand development products to their list of available tools. Inprise Corp. has entered into an agreement with Troll Tech AS to include Troll Tech's Qt GUI application framework in the forthcoming Borland Delphi and C++ development suites for Linux.

Kylix is on target, according to Inprise's Swindell.

The effort to build Borland Delphi and C++ for Linux, codenamed Kylix, centers around the development of the Visual Component Library or VCL, which is a set of Linux-compatible program classes and components that handle communications with the operating system. Borland already has developed the VCL for Windows, and has committed to building an identical set for Linux. The Delphi and Borland C++ suites are in beta.

The VCL components are a critical part of how Borland developers build applications quickly and easily, according to Michael Swindell, director of product management for Linux tools at Inprise. And while Microsoft's Windows provides a multitude of standard interfaces that developers can access by calling the VCL, Swindell said such standard interfaces are lacking in Linux. And it is those interfaces that give native applications the "look and feel and the right behavior," while providing developers an "easy, high-level way to deal with the operating system," said Swindell.

That's where Troll Tech comes in. According to Swindell, Troll Tech's Qt is one of the two most common graphical interfaces in use by Linux developers. "We're using Qt in the same way that we would use Windows GDI and Windows common controls," said Swindell. "So we're still building components for everything exactly the same way we do it for Windows, but instead of calling Windows, we're calling Qt."

Based in Oslo, Norway, Troll Tech (www.trolltech.com) markets cross-platform GUI development tools.

One of the greatest advantages of the relationship with Troll Tech, said Swindell, is using the Linux and Windows VCLs to provide application portability. "It's going to be very straightforward to move your applications from Windows over to Linux, or vice versa. For an IT manager that's important, because if you're trying to decide today [whether to] take applications to Linux, that might be a pretty costly and risky proposition. But if you can go pick up Delphi today and start building your applications, when Kylix is available, that risk and cost are no longer a factor. Nobody has ever done this," he said.

Troll Tech offers open-source and commercial licenses for Qt, and its agreement with Inprise will permit Kylix developers to have their choice of creating open-source or proprietary applications. "Most developers in our current customer base do not do open source," Swindell said. "However, going into a new market area, a lot of our new customers interested in Kylix are open-source developers."

Under way since August 1999, the Kylix project is still on track for release later this year, although Swindell said it is unlikely to be ready by midyear, as had previously been announced. ▮

Delivery System is Paradise

With the success of its electronic sales delivery system, Programmer's Paradise Inc. has created an in-house unit expected to provide better customer service while offering improved software integrity and security, the company announced.

A deal with Preview Systems Inc. to provide proprietary download technology for its new business unit will enable both vendors and customers to receive more secure products, said Alexander Alarid, vice president of Internet operations for Programmer's Paradise (www.programmersparadise.com). "The back-end process involved in downloading product is where Preview comes into play," he said. With decryption of an encrypted file using a legal key or certificate necessary after it's been downloaded, "Preview wraps the executable file, securely downloads it and decrypts the file," he said.

He said vendors had expressed concerns about their products being breached during the download process and that Preview Systems would adequately address those concerns. Alarid said electronic delivery of programs was 170 percent above the first quarter of 1999 with an outsourcing service providing the downloads.

He also said reporting capabilities within the Preview system would enable vendors that sell product on the site to track their sales and record to whom those sales are going. He added that Preview's technology has stateful failover, allowing a disconnected download to resume from the point at which the connection was broken. ▮

Java U. Class To Focus On EJB Resale

ComponentSource, Inferdata Corp., Iona Technologies Inc. and Inline Software Inc. are sponsoring a Java University class at the upcoming JavaOne conference June 6 to 9 at San Francisco's Moscone Center, designed to teach developers how to build commercially viable Enterprise JavaBeans (EJBs) for resale.

"We're trying to educate the Java market so it becomes as mature as the COM market," said ComponentSource chief financial officer Bill Wilkerson. He said the COM market now features robust tools that use drag-and-drop to a great extent for the development and assembly of components.

About the course, Wilkerson said it is one of the first in the industry to emphasize the technology, discuss the features required in components if they are to be commercially viable, and address how to develop business apps using the components.

He said the alliance among the companies stems from their vision to use EJBs to construct components for applications that can be used for resale, rather than write the entire application by hand. ▮

News Briefs

COMPANIES

Microsoft Corp. has selected **Lionbridge Technologies Inc.** as the sole authorized provider of compliance testing for applications to run on Pocket PC, Microsoft's platform for handheld devices . . . **The Santa Cruz Operation Inc.** has joined the Free Standards Group, an assembly of Linux-leading companies pushing to establish the Linux Standard Base. The LSB is designed to help Linux reach a new level of maturity by giving ISVs a single-port target and a single standards reference . . . **VenturCom Inc.** has acquired consulting and development service provider **Chesapeake Bay Systems.** Terms of the deal were not disclosed. VenturCom develops technology that makes Windows fast enough and small enough to operate in industrial systems and communications systems . . . **Intelligent Medical Objects Inc.** has sold its database analysis software, Virtual DBA, to **Quest Software Inc.**

PRODUCTS

ParaSoft Corp. has released **CodeWizard 3.1**, an error detection tool for C and C++ that has been upgraded with an additional 25 preset rules for C developers. Also, the company's RuleWizard module, which allows developers and managers to write their own rules, has increased capability and ease of use, ParaSoft said. CodeWizard is available for AIX, Linux, Solaris and Windows 9x/NT, among others, and sells for $995 per user . . . Bristol Technology Inc.'s **eXactML 1.1,** which allows developers to XML-enable their C++ applications, has been updated to include a parser customized to a given Document Type Definition (DTD) or schema, which the company claims is three times faster than a Document Object Model (DOM) parser. It runs on Windows; the resulting source code can be compiled on Windows, Solaris and Red Hat Linux. A single developer license starts at $690 . . . Tashcom Software has updated its Active Server Pages code editors with the new **ASPEdit 2000** for Windows 2000. The new release features a color-coding highlighter that highlights HTML, ASP, VBScript and other scripts from text. It also supports WebTV tags and Allaire's ColdFusion Web-development software and can generate SQL functions via an SQL query builder . . . **Windows Services for Unix 2.0** is now available from Microsoft Corp., providing a mechanism to take advantage of existing Unix resources and expertise while simplifying network administration and account management in a mixed Windows NT/2000 and Unix-based environment, the company said. Windows Services for Unix 2.0 allows users to share files across the systems via the Network File System (NFS) protocol . . . KL Group Inc.'s **JClass 4.5** now supports the Extensible Markup Language (XML), and the Java Development Kit (JDK) version 1.3 from Sun Microsystems Inc., according to a company report. The addition of XML support will enable JClass 4.5 developers to populate Java components such as JClass Chart, LiveTable and PageLayout using XML-based data sources. PageLayout is now included in the JClass Enterprise Suite and can output HTML data. JClass 4.5 is available now; pricing begins at $499.

PEOPLE

WOODWARD

Serena Software Inc. has promoted **Mark E. Woodward** to the positions of president and chief executive officer. Woodward, 41, joined Serena in November 1998 as vice president of sales and was promoted to vice president of worldwide operations in February of this year. Woodward succeeds **Richard A. Doerr**, who will remain on Serena's board of directors . . . **Jack Iacobucci** has been named CEO at Rogue Wave Software Inc. effective May 1, replacing interim CEO **Bruce Coleman**, who had served since October 1999. . . . **Sar Ramadan** was expected to leave his position as chief financial officer at Onyx Software Corp. on April 30. Ramadan has accepted the position of chief financial and operating officer for Askme.com, based in Seattle . . . **Chris Gahagan**, formerly of Sterling Software Inc., has joined BMC Software Inc. as vice president and general manager of the Recovery and Storage Management division. ▮

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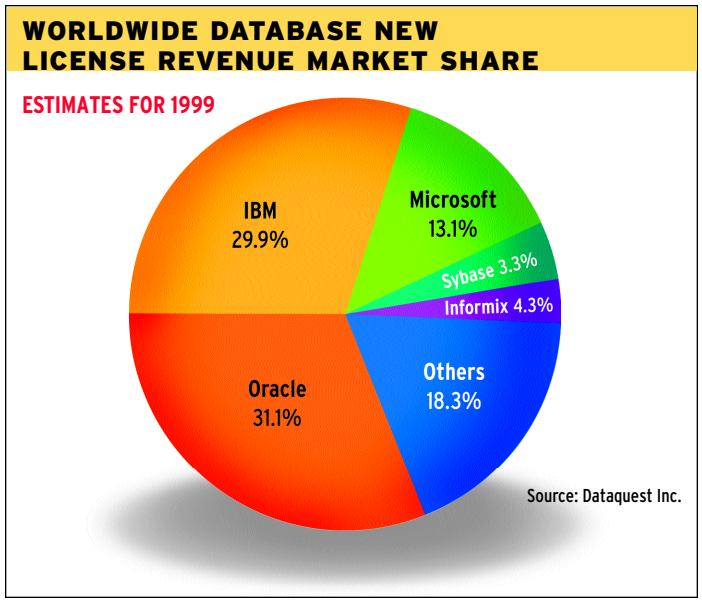
Database Market on Fire

Market grows 18 percent, says Dataquest

Maybe it wasn't as hot as last year's Nasdaq, but 18 percent annual growth isn't bad. According to market-research firm Dataquest Inc., that's how fast the database market grew, reaching total sales of $8 billion in 1999.

The numbers, unveiled at Dataquest's annual Dataquest Predicts 2000 conference, also show Oracle barely holding onto its top spot, capturing nearly one-third of new database license revenue for 1999.

"Oracle and IBM are still virtually neck-and-neck for the top position in the overall database market," said Norma Schroder, senior analyst for Dataquest's Database and Data Warehousing Software Worldwide program.



"Oracle, despite its large base, had vigorous database new license growth of 19 percent, driven by its new positioning as an Internet platform and by strength in its CRM and e-commerce enterprise applications business," said Schroder. "IBM had a robust year, with strength on the mainframe platform, a spurt of almost 70 percent growth in its relational Unix database products and a 125 percent growth in its NT relational database products. Microsoft came roaring back this year in the relational NT segment, driven by its new version of SQL Server 7.0."

According to Dataquest (www.dataquest.com), the worldwide database industry is forecast to reach $12.7 billion by 2004, with Windows NT platform revenue almost equaling Unix platform revenue. "Oracle, IBM and Microsoft will be the dominant players, but there is still plenty of room for vendors that can cater to niche application areas or industry-specific markets," Schroder said. "A new niche we're seeing is start-ups catering to the application service provider/hosting market with low-cost, high-performance data solutions tailored for Web data, rather than OLTP [On-Line Transaction Processing] data." ▮

IBM Pays Partners More

IBM Corp. is changing the way it compensates its partners, with greater rewards going to IBM solutions developers than ever before. In the first move of its kind, IBM will calculate compensation to its partners based on the amount of value added to the sale and on the type of customer being serviced, giving greater margins for selling to small and medium-sized businesses.

IBM says the new program will shift incentives away from simply moving boxes toward rewarding service and solutions providers that add value. Examples of value include marketing custom applications and providing training and other consulting services.

"In the past, we had specific discounts and provided rebates for any kind of fulfillment, regardless if there was any value added or not," said James Neiser, vice president of IBM software distribution channels. "Quite often that leads to price competition and cost-plus type models," where value-add is nonexistent, he said. The company will therefore steer its rebates and margins toward value, a move paid for with reduced margins for order-takers.

In addition, the company will increase rewards for selling to small and medium-sized businesses, a fast-growing market segment that IBM estimates could reach $25 billion by 2003. IBM has traditionally targeted the large enterprise, Neiser said, but is widening its focus. ▮

DB2 7.1

◂ continued from page 1

provides a user-defined map from the XML Document Type Definition (DTD) to the database tables. "It's an IBM thing for now," said Jones, adding that the company is pursuing the standardization avenue for DAD. IBM has also enhanced the DB2 Text Extender, which provides the ability to search and manipulate plain-text fields, he continued, saying that for the first time, DB2 supports high-speed in-memory text searches. "In-memory text searching is new," said Jones.

A second focus for DB2 is federated data access, or accessing multiple DB2 systems and platforms from a single data query. "Distributed queries and the DB2 Data Links Manager are now native," said Jones, stating that it's now easier to support queries across platforms.

A key new feature for heterogeneous database shops is federated data access to Oracle 8i databases servers. "It's just read-only for now," explained Jones, who would not commit to a time frame for a read-modify link with Oracle.

DB2 can also manipulate external files stored on disk volumes. The goal, Jones said, is to allow a database to manage an entire business file system. "This is the same approach that Oracle is doing with their IFS [Internet File System]," he said, adding, "Oracle's approach is to move everything into Oracle [database] tables. Our approach is to leave everything where it is" but still provide the ability for a single database to manage the data. When asked which other non-IBM databases are being targeted by the DB2 development team, he mentioned Microsoft's SQL Server, as well as Informix and Sybase.

As part of its drive for interoperability—as well as to help the company win over competitors' customers—IBM has introduced a new SQL-based stored-procedure language for DB2 7.1. "Previously, you could write stored procedures in just about any language, such as COBOL or Java," said Jones, "but you couldn't write them in SQL." That, he said, will make it easier to migrate database applications to DB2 from Informix, Oracle or Sybase, whose platforms have long offered SQL-based stored procedures.

SPEAKING OF MICROSOFT

Although DB2 has been available for Windows NT Server for some time, the latest version will be more tightly integrated with Windows 2000 Server. "DB2 7.1 adds support for Active Directory, Kerberos authentication and named volumes," said Jones. Windows NT/2000 will be among the initial shipping platforms for DB2 7.1, he said, along with OS/2 Warp Server, Linux, AIX, Solaris, HP-UX and NUMA-Q. The OS/390 version is going into beta test in June, he added, and also confirmed that a DB2 update is planned for OS/400, though he would not provide a release schedule. "There will be one, but I'm not saying anything about it," said Jones.

In addition, Jones cited tighter integration of Microsoft's Visual Studio development suite with DB2. "We've added DB2 push buttons into Visual Studio," he said, adding, "We have not shifted our emphasis from [IBM's] Visual Age, but we acknowledge that the world is very fond of Visual Studio."

Jones pointed out that since 1996, DB2 has had Java support for stored procedures and JDBC, or Java Database Connectivity. What about the new release? "DB2 7.1 now supports JDBC 2.0, which has a more significant focus on distributed enterprise-scale applications support," he said.

A few more updates for DB2 7.1, said Jones, are its newly integrated data warehousing features and a new pricing model for application service providers (ASPs). "Visual Warehouse goes away," he said, referring to an extra-price application; its functionality is added directly into DB2, with a new graphical tool called Data Warehouse Center, claimed to provide faster application development.

The new ASP pricing model, he explained, is designed for service providers who don't want to make the often-huge upfront commitment for a per-processor or per-user license for DB2. "ASPs can now opt for a per-transaction or per-subscriber model," said Jones, saying that this allows service providers or application hosts to offer database technology on a cost-plus basis. "When they get started, they pay us nothing, or next to nothing," he said, "and pay as they grow." The specific terms of the new licensing plan, or of DB2 7.1's pricing in general, were not disclosed.

IBM's beta site for DB2 7.1 is at www.ibm.com/software/data/db2/udb/v7/beta. ▮

WHY SEVEN POINT ONE?

Why is the latest update of IBM's DB2 Universal Database numbered 7.1, not 7.0? Jeff Jones, senior program manager for IBM's Data Management Solutions division, laughed at the question. "It's a culture thing," he said, adding that the first release of version 6 was similarly numbered 6.1. "Some developers like to number their products starting with dot-zero," he said. "The DB2 team likes dot-one."

Jones denied that the dot-one scheme was an attempt to outflank corporate buyers, who often are leery of dot-zero releases. "We've been doing this for a long time," he said, adding that customers are used to IBM's conventions. "We don't even use the point for our OS/390 software," he pointed out, saying that the mainframe release will be called Version 7. –Alan Zeichick

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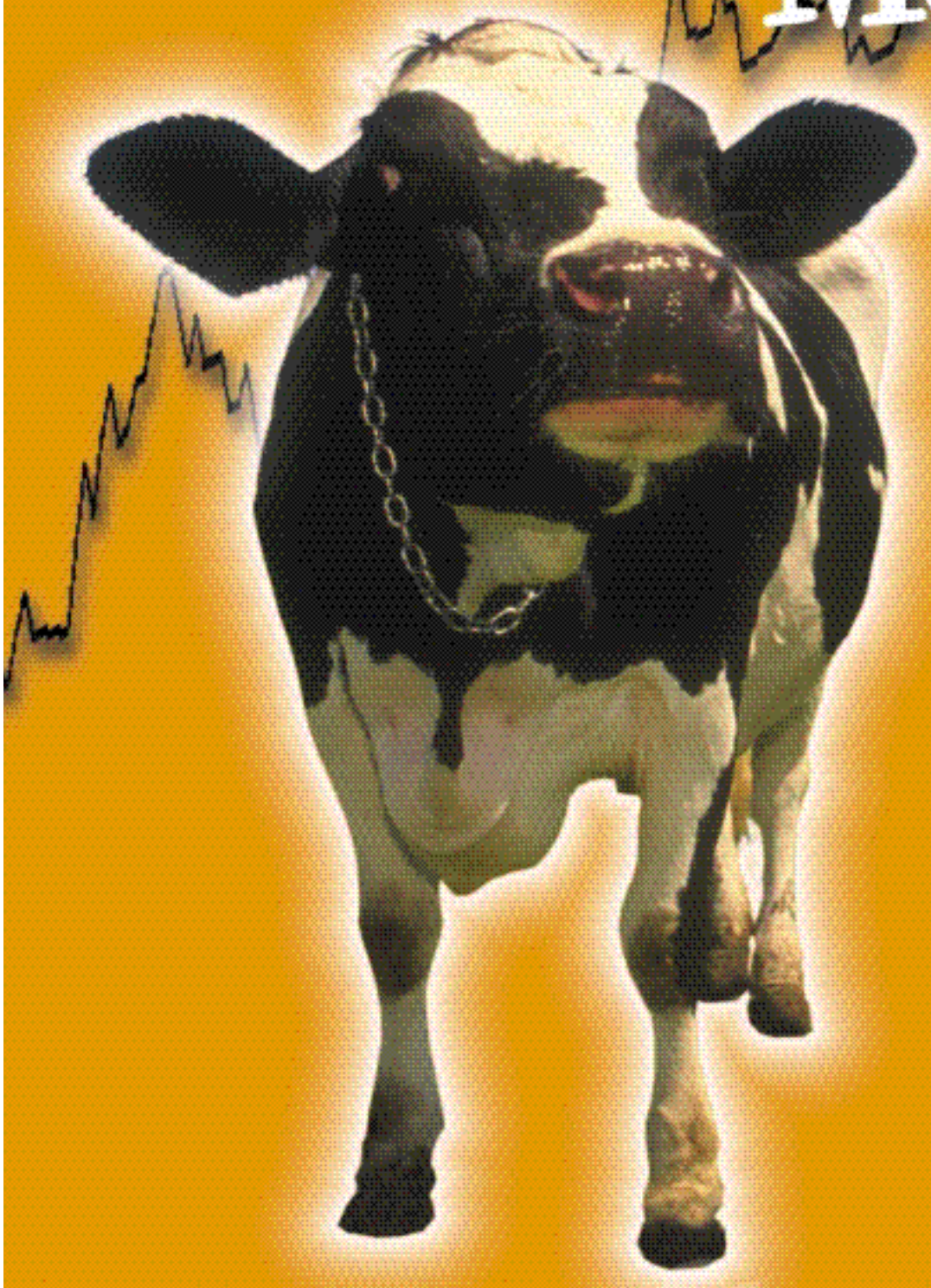

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METROWERKS LOOKS TO SUN, EMBEDDED LINUX

Company to develop Java Card tools, joins Embedded Linux Consortium

BY EDWARD J. CORREIA

Metrowerks Corp. has joined forces with Sun Microsystems Inc. in an effort to arm its CodeWarrior developers with tools for Sun's Java Card language specification. The alliance will give Metrowerks access to Sun's vast Java resources, as well as the opportunity to produce the first complete set of programmers' tools for a market of which Sun claims to control about 90 percent.

Under the agreement, Metrowerks (www.metrowerks.com) will integrate Java Card development components with its CodeWarrior integrated development environment (IDE).

Java Cards are smart cards equipped with a specialized Java Virtual Machine, as well as a small amount of volatile and read-only memory. According to the specification, Java Card applications should be able to run unaltered on Java-enabled smart cards from different manufacturers; the JVM permits multiple programs to run simultaneously. A recent GartnerGroup study predicted that 3 billion smart cards will be in circulation by the end of this year, compared with about 900 million credit cards.

According to Luis Quiroga, product marketing manager at Metrowerks, Sun chose Metrowerks for the project because of its commitment to the Java platform and to the Solaris operating system. For its part, Sun will receive a "complete end-to-end solution that will allow developers to target the Java Card platform," said Quiroga, adding that Metrowerks, which is a wholly owned subsidiary of Motorola, expects to begin shipping its Java Card tools early next year.

Java Card (http://java.sun.com/products/javacard) components include the Java compiler, an executable file generator, a code verifier, a Java Card emulator and a debugger and other tools, all of which will be integrated into the CodeWarrior IDE.

METROWERKS EMBRACES EMBEDDED LINUX

Metrowerks will develop a version of its CodeWarrior cross-platform IDE for embedded Linux. "The market for Internet appliances, mobile wireless devices, set-top boxes and other embedded systems applications is growing extremely fast," said Greg Stoner, vice president of marketing at Metrowerks. "There's a large amount of interest in using embedded Linux for these devices, and we see an opportunity to provide development tools."

Metrowerks currently offers GNU Edition tools for Red Hat and SuSE distributions of Linux, but would not comment on which embedded Linux distributors the new IDE will support. The company expects to begin shipping a product by year's end.

The company also has joined the Embedded Linux Consortium (www.embeddedlinux.org), which held its first meeting at the Embedded Systems Conference in Chicago in March. Stoner will sit on the consortium's board of directors. There are nearly 100 consortium members, including 3Com Corp., Hewlett-Packard Co., IBM Corp., Lynx Real-time Systems, Red Hat Inc. and Wind River Systems Inc. ■

OnCore Divides, Conquers Embedded Linux Performance

BY EDWARD J. CORREIA

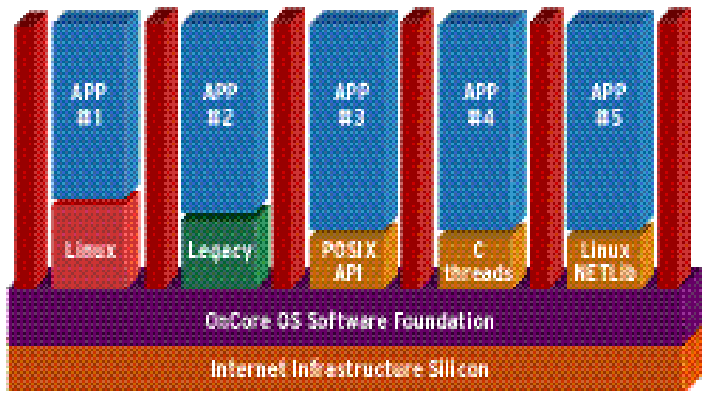
When OnCore Systems Corp. set out to improve the performance of embedded Linux, its strategy was to divide and conquer. OnCore found that by using the hardware available in modern machines more efficiently, it could break up the tasks Linux was running and run the most critical ones first.

The result was OnCore Systems Software Foundation, or OnCore OS, and OnCore Linux for Real-time, an environment the company claims offers 8-microsecond context switching and does not require proprietary development tools.

"We started out trying to solve a few problems that the traditional embedded real-time operating systems didn't solve well," said Chip Downing, president and CEO of OnCore Systems (www.oncoresystems.com).

The first of those two problems was connectivity, he said. "How do you put a system in a distributed framework and have it work well with other processors?" The second was the concept of using the memory management unit to allow each application to run in its own protected partition. "That's what we call our foundation," said Downing.

Running each process, including Linux itself, as a task in protected memory enables the foundation to control which tasks run first, and gives the OnCore OS microkernel the ability to preempt Linux—something that would be impossible otherwise.



OnCore OS Software Foundation runs each task in its own protected memory space, including Linux itself, and requires no special developers' tools.

"The microkernel itself has interrupt handling, a scheduler and memory management unit protection," he said, but drew the line at calling the foundation an RTOS, opting instead for the simpler "operating system" characterization.

Downing also considers the term "real-time Linux" an oxymoron. "Real-time Linux is a whole other thing, [and] I'd like to dispute that term. We don't say that [OnCore] Linux is real-time. We state that upfront."

OnCore is primarily targeting network switch manufacturers, which Downing knows will put the company into competition with the likes of Wind River Systems Inc., but he remains confident. "People that need to have memory protection and virtual memory management that are using Wind River [RTOSes] right now find a lot of the product attractive," he said.

"Everybody else in the RTOS arena offers an opportunity to turn on the memory management unit, but they don't allow full partitioning [or] a robust virtual memory management system underneath, and they don't do distributed processing," which Downing said are the main differentiators between the OnCore solution and those of competitors such as Wind River's VxWorks and pSOS.

But despite its proprietary microkernel, Downing claims that application development for OnCore Linux for Real-time remains exactly the same as any other distribution, further distinguishing it.

"That's [another] way we differ from the traditional RTOS, where you get into this whole proprietary development environment," he said. Developers can write programs to run on OnCore Linux for Real-time using GNU developers' tools, he said, which are included in the OnCore Operating System Development Kit.

In addition to its new version of Linux for Real-time, OnCore now offers LinuxOnDemand, which permits embedded applications to invoke a temporary instance of Linux just long enough to run a required task; and LinuxOnCall, which strips out the Linux processes and overhead and allows Linux applications to make direct microkernel calls, which the company said can significantly reduce target memory requirements.

Downing would not reveal exact prices on any OnCore products, preferring instead to characterize them as "competitive, but not free." He went on to describe the company's flexible pricing structure, which he said is sometimes royalty-based. "We work with our developers and figure out a mutually rewarding way to sell and support the product," he said, indicating that different customers like to account for product costs in different ways, "so we load up [fees] into service, or do something in a development kit. Each customer is going to be a separate situation," he said. ■

Microware Teams With MIPS

Embedded systems developer Microware Systems Corp. has entered into an agreement with MIPS Technologies Inc. to supply the processor maker with its OS-9 embedded RTOS, which it will optimize for the MIPS32 and MIPS64 RISC processors. Microware also will provide a development environment designed for the digital entertainment applications that generally run on devices equipped with MIPS products.

In addition to the OS-9 RTOS, MIPS will have access to Microware's HAWK integrated development environment; its digital audio/video interactive decoder, also known as DAVID; and Microware consulting services.

"If a product developer needs a solution that includes a MIPS32 or MIPS64 design, the Microware solution is available with the components needed for rapid application development," said Brian Knowles, vice president of marketing at Microware (www.microware.com). The Microware software will be provided on the Atlas reference board from MIPS, with support for other reference boards to come later.

"Their value proposition is exactly in sync with ours," said Ken Kaplan, president and CEO of Microware. "By using MIPS processor [intellectual property], device developers save an enormous amount of time and eliminate just as much frustration." ■

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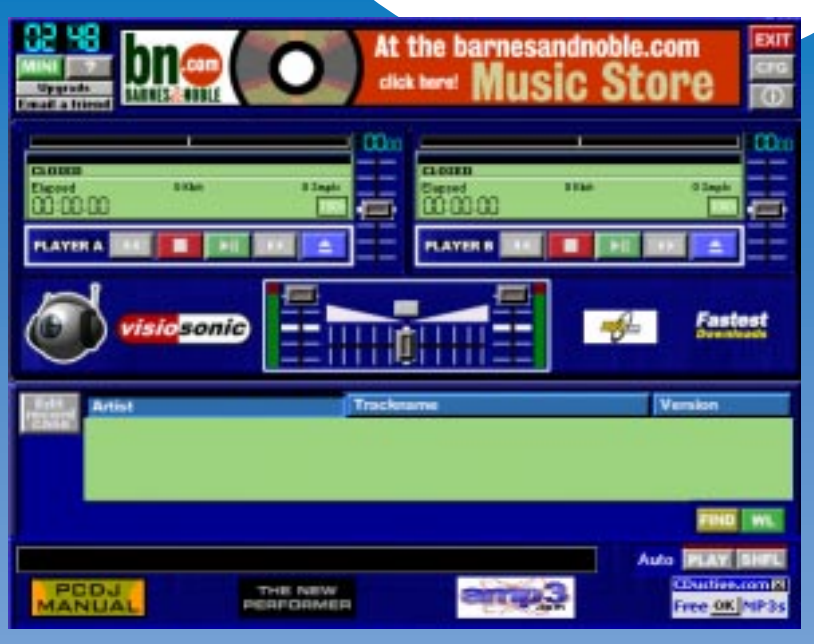

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Improves platform determinism, maintains development standards

BY EDWARD J. CORREIA

Embedded Linux developer MontaVista Software Inc. has released a real-time task scheduler for Hard Hat Linux, the company's version of Linux optimized for real-time applications. The scheduler modifies the way Linux handles real-time task prioritization, a scheme the company says preserves the standard Linux programming model and APIs, while offering programmers a way to develop solutions that meet certain real-time requirements.

"What we've done is to insert our scheduler in front of the standard Linux scheduler," said Bill Weinberg, director of marketing at MontaVista. "When you build our Linux kernel, it becomes part of the scheduler. It's a separate module, and we're not hacking the [standard Linux scheduler] to death."

MontaVista's goal was to make Linux itself better, said Morgan.

The traditional Linux scheduler has 40 priorities for dealing with noncritical tasks, plus an additional 100 priorities for handling real-time policies, which Weinberg said are viewed by Linux merely as priority suggestions.

A normal Linux scheduler would examine every entity that can be scheduled in the system before choosing which thread to run. "So if you've got tons and tons of threads in a system," Weinberg said, "it will examine them all. The more stuff you've got, the longer it takes."

This nondeterministic behavior, said Weinberg, is overridden by the MontaVista scheduler. "It looks at all of the processes or threads that are identified by the real-time policy and schedules [and executes] the highest-priority one that is ready to run." Developers assign priorities to the tasks generated by their programs during development.

MontaVista's (www.mvista.com) method of improving Linux determinism is far removed from the approach taken by other real-time Linux developers, said Kevin Morgan, the company's vice president of engineering.

"OnCore, [Zentropics'] RTAI and RT Linux all have a very nice approach," he said, which is to have a lower-level kernel with its own environment for running real-time processes, and they run Linux as the least important process. But writing applications for their kernel requires a completely different set of developer's tools than Linux programmers use, according to Morgan. "The RT Linux and RTAI strategies are different, like a middle path; they don't let Linux itself do the real-time stuff. Our goal was to make Linux itself better without breaking it or introducing new APIs. Our [scheduler] has zero impact on the programming environment," he said, but pointed out that MontaVista's real-time scheduler does not address all of the issues relating to real-time applications in Linux. ■

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TINI

◂ continued from page 1

either 512KB or 1MB RAM on board, which the company said has been enough for most applications targeted by its beta users, although it can address a maximum of 4MB RAM plus 512KB flash memory. Files are delivered to the target via FTP, with applications being administered via Telnet.

The board is compatible with Java 1.1.8, and applications can be developed using standard Java tools, including the Sun JDK and JBuilder from Inprise/Borland. TINI does not yet fully support Sun's Jini specification for network device communications, but does support Jini proxy, which defers function calls to a server. The company said it will add elements of Java 1.2 for full Jini support in the near future. The cost for the beta TINI board is $50; final pricing is not yet set.

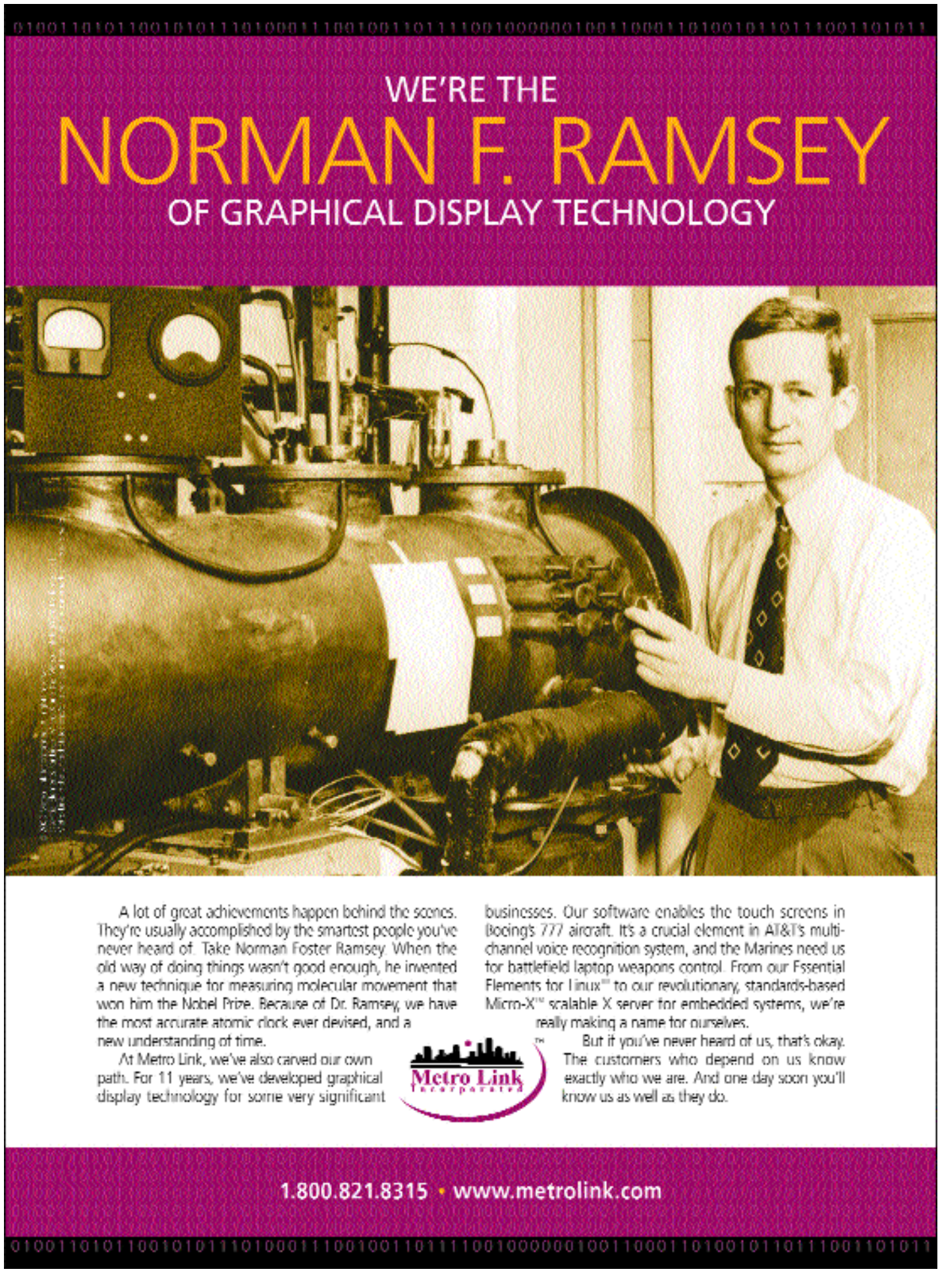
Dallas Semiconductor (www.dallassemiconductor.com) has gained renown with its iButton series of single-purpose devices, which are Java-based versions of its 1-Wire technology that the company has been marketing for about 10 years. The coin-sized iButtons are used in everything from security applications to cash substitutes.

"It's a computer chip encased in a stainless steel can," said the company's Internet communications manager Syd Coopersmith, who described the pods as "data to go." Information from within the iButton is sent back and forth to "blue dot" receptors, also made by the company, which in turn communicate with a central computer. TINI, which includes a 1-Wire interface needed to communicate with a receptor, can act as the central computer and send or receive information via Internet protocols.

"We have sold 37 million of these [iButtons]," which are mostly used for access to buildings, she said. But the company is seeing more demand for the devices in "small change purse" applications, for access to such things as transit systems, parking meters and gas pumps.

The TINI package also includes two Controller Area Network (CAN) circuits, which give the device the ability to control more than just a single appliance, according to Coopersmith. "You wouldn't put a $50 TINI board into your toaster," Coopersmith said, but she indicated that one TINI-equipped appliance could serve multiple appliances, making the solution more cost-effective.

"The general idea is that virtually everything in your house that's plugged into the wall will be able to be networked," she said. Currently, only Ethernet and modem-based communications are supported, but the company is exploring methods of inter-device communications over household power circuits. ▮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REALSYNC SERVER KEEPS HANDHELD DEVICES IN TOUCH

Mobile computing solutions provider Synchrologic Inc. (www.synchrologic.com) has released RealSync Server 3.0, the latest version of its synchronization software for PalmOS and Windows CE devices.

Through an available API, the software gives developers a means to connect and synchronize mobile device data with enterprise-class databases from Oracle, Sybase and others, with or without wires. The 100-user version costs $9,900. ▮

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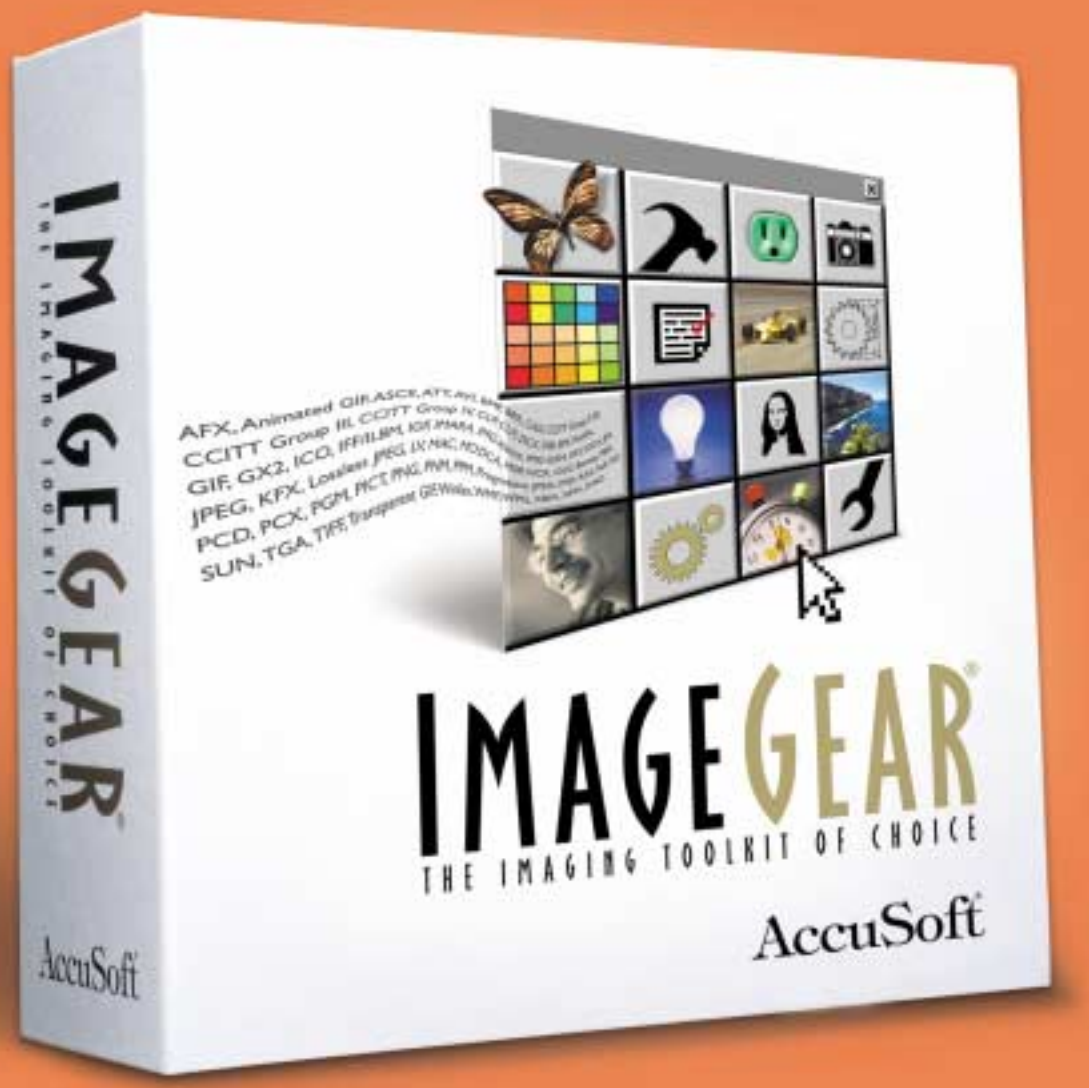

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EDITORIALS

Serious XML Databases

It seems as though you can't pick up a technology newspaper—certainly not an issue of *SD Times*—and find a story that doesn't mention the Extensible Markup Language. Increasingly, XML is seen as not only the key to e-business, but also as a viable intermediary format for message passing and data translation within an organization's disparate applications.

But where is that data? In databases, most of the time, and much of the larger enterprise database software has been behind the curve when it comes to XML. IBM's DB2 6.1 database, for example, understood XML only as an extension of its text-field data type, thanks to a plug-in extender.

The good news is that the major databases are getting savvier about XML. The forthcoming DB2 7.1 has XML as a native data type. Microsoft's SQL Server 2000, now at second-beta stage, also has enhanced XML support.

Oracle already has significant XML support in its database platform, which may be a reason why the company has maintained its position as the database leader for 1999, with IBM a close second. Microsoft trails the others, with less than IBM's market share for new software licenses.

XML support may be one reason—but cross-platform capability is more likely to be a more important factor in a company's decision whether to deploy Microsoft, Oracle or IBM.

If Microsoft's legal woes end up in a breakup of the software giant into separate operating-system and applications-software companies, it would be easy to imagine that the entity holding the BackOffice suite would have no particular incentive to keep it exclusively on Windows. In that case, Oracle, IBM, Sybase, Informix and others might find themselves competing against SQL Server for Linux or Solaris.

Considering how successful SQL Server has been in small and medium-sized businesses, a scalable SQL Server could mean big trouble for the plans of the other database providers, all of whom base part of their business on helping growing businesses scale from SQL Server.

Wouldn't *that* be an interesting turn of events.

The Good, The Bad and the *e*

We would be remiss if we didn't comment on the proliferation of the letter "e." No, not proliferation—the ascension, the dominance, the sheer supremacy of the letter "e." We've all suffered the pain of hearing about e-tailers and e-velopment. Annoying as this butchery of the English language is, we must all accept that we're still at the beginning of this e-volution.

The latest and most high-profile adoption of that now-trendy fifth letter is Ziff-Davis Publishing Inc.'s renaming of the venerable *PC Week* as *eWeek*. Is it a different publication? No, not really, but the name change underscores how much our world has changed over the past decade.

The personal computer is no longer the platform for technological innovation and business computing. Faster microprocessors and snazzier desktop operating systems don't lead to greater productivity; the real drivers are new Internet standards and technologies. It's not about APIs, but about middleware; usable bandwidth matters more than high-end RAID controllers.

The Internet, not the PC, is now the platform. ▮

GUEST VIEW

APPLICATION TESTING CLICKS WITH E-BUSINESS

Application testing is finally getting the respect it deserves, and with good reason. Organizations channeling business through the Web have a very clear understanding of the importance of testing. Historically, businesses have learned this lesson the hard way, by neglecting the proper testing and realizing that those results—such as slowdowns, application errors and downtime—directly impact the bottom line. It's the language the business side of the house understands well: Thorough testing efforts can mean the difference between profit and loss for the Web business channel.

STEVE CAPLOW

Businesses that don't know how they are servicing customers via Web-enabled channels are operating blindly and are setting themselves up to continually react to crises. And rarely are strategic long-term business decisions made when businesses are reacting this way. Operating in reactive mode stifles systematic business growth and damages a business's ability to gain end-user trust in its Web-enabled systems. Businesses need to know how their customers are experiencing their site at different load volumes to make sure they are not unknowingly turning customers away or damaging their reputation.

The most difficult step toward implementing actionable testing for any Web application is getting started. Where do you begin? What skills and tools are needed? How do you establish and maintain adequate quality goals that satisfy both technical and business requirements? IT groups face the difficult challenge of striking the right balance between creating applications for operational superiority, while simultaneously ensuring that online business processes are competently represented and delivered on time. Here is some advice to those working hard to test their Web-enabled enterprises.

Enforce Team Communication: Typically, many individuals—such as the chief technical officer, design engineer, developer, tester, Webmaster, database manager and operations manager—are each responsible at some level for a company's e-business application. Clearly defining application-quality standards and stating expectations about how each is responsible for achieving business-quality goals is a logical place to start. Keep the momentum of continuous communication rolling as the application evolves through its life cycle. Communication will ensure everyone is working toward the same goals, eliminate redundant tasks, enhance productivity and improve upon business-quality standards as new technologies are adopted or the application design is modified.

Start With Application Design: Major design flaws and the inability to support a high volume of concurrent users are more difficult and costly to remedy just prior to deployment. Therefore, begin early by testing the scalability of each piece of the application architecture. This typically includes Web servers, application servers, database servers, networking pipes and connectivity to existing back-office systems such as legacy or ERP. Also, make sure to step through application logic and carefully consider the application's usability. The goal is to make the application as easy as possible for users to navigate and obtain results. Based on the types of transactions and the expected traffic volumes, make key decisions about such things as database indexing, expansion of Web and application server farms, load-balancing technologies, fail-over strategies and how transaction security will be handled.

Introduce Automation: Web applications change frequently, are built to handle many users and must be able to react to traffic spikes. Start by developing an initial bed of tests to run against the application. Look for tools that are easy to learn, easy to use and accommodate your development environment. Test scripts must be flexible and easily updated to accommodate frequent application changes. Use the first round of test results as the benchmark for future tests to be measured against. Test for functional correctness to uncover such things as broken links, page errors, transaction flow errors and unrecognized images. Test the scalability to understand page download response times and transaction round-trip times as the volume of concurrent users increases. Use the test results to make performance adjustments. Repeat this process before deployment until defined application-quality standards are achieved.

Monitor the Production Application: Continue the testing effort into production by using application monitoring techniques and tools that measure request-response times of various emulated transactions at defined time intervals. This practice provides a way for businesses to know whether or not customers are being serviced within the business requirements previously defined.

Leverage Actual User Behavior Patterns to Continuously Improve Testing Efforts: Utilize transaction type and volume data gained from your live application to augment performance tests and work toward making them as close to actual user behaviors as possible. Taking the time to do this will provide more accurate test results over the life cycle of the Web application.

Testing for application scalability and functionality should be a top priority as early as the application design stage, and should continue to be a priority into the production environment. The process of testing must be continuous and cyclical, using previous testing efforts to improve future ones. The life-cycle approach to testing will position IT groups to adapt more easily to new technologies and deliver applications flexible enough to handle ongoing change. Clear and constant communication in support of business-quality standards for Web applications combined with the practical implementation of continuous application testing will keep organizations in control of their Web applications and smooth the transition into the world of electronic business. ▮

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THE ESSENCE OF UML

It's amazing how fast new technologies take off. Okay, none has been as successful as the "ILOVEYOU" virus, which took over the world in a single day. But think about how few months transpired between the invention of MP3 and its showing up on your company's PCs. Or how quickly XML became the centerpiece of the business-to-business e-commerce revolution. Or how swiftly the Unified Modeling Language (UML) took over as the basis for developing, explaining and documenting object-oriented design.

With such fast-moving technologies, knowledge often lags behind adoption. For example, many software development professionals haven't even heard of object-oriented design, or know what it means. Others may have been exposed to UML's precursors, such as Grady Booch's Rational Unified Process, and not realize that it's the same as UML. Some people read about UML when first approved by Object Management Group Inc. (OMG)—but it's evolved significantly since then.

One quick way to get up to speed is to read Martin Fowler's "UML Distilled, Second Edition." Written with Kendall Scott, Fowler's book isn't "UML for Dummies." (No, IDG Books hasn't published that title yet, though they do have "MP3 for Dummies.")

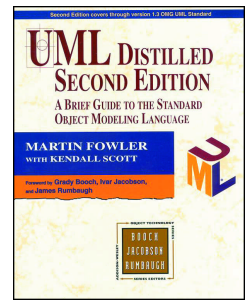
Rather, it's a concise overview written for experienced developers or development managers who want to understand UML in a nutshell. And yes, there *is* a book called "UML in a Nutshell," from O'Reilly & Associates, though it's woefully out of date. Unfortunately, "UML Distilled, Second Edition" is slightly out of date as well, despite its publication this year. Fowler covers UML 1.3 as it existed before OMG finished work on it in June 1999—and now OMG is about to conclude its work with UML 1.4 and is talking about UML 2.0. None of that, however, detracts from the value of Fowler's book.

"UML Distilled" begins by presenting not the lines and arrows that make up the Unified Modeling Language itself, but rather the bigger question of object-oriented analysis and design, and by presenting an overview of Fowler's own simplified variation on the Rational Unified Process, developed by Rational Software Corp.'s three amigos: Booch, Ivar Jacobson and James Rumbaugh.

Just as it's not a genuine tutorial on UML, neither is this book a tutorial on the object-oriented development process; Fowler and Scott present enough to set the tone and ensure that everyone's on the same page. Someone unsure of what object-oriented design and development is could try reading Chapter 2 of "UML Distilled." Anyone who makes it that far should be ready for the next step, beginning with the third and fourth chapters, which do a fine job covering use-case diagrams and basic class diagrams; without use cases and an idea of the requisite classes, it's hard to imagine any object-oriented project succeeding.

When covering those concepts, and others in the remainder of "UML Distilled," the authors really stick to the essentials, with new areas receiving only a few pages each. They tell what something is, show what it looks like in graphical terms and then provide a context that explains when to use this type of diagram and its notation. The writing is clear and lucid and there are many interesting side trips, such as Bertrand Meyer's fascinating idea of design by contract.

The next two chapters, on interaction diagrams and more advanced class diagrams, aren't as clear; by this point, there are many symbols in a typical UML diagram, even the simple ones used in "UML Distilled," and it's hard for neophytes to keep them all straight. Individual drawings of the symbols, such the different arrow and line types, would be a welcome complement to the chapters' complete sample diagrams.



Chapter 7, on packages and collaboration, might confuse developers who are used to Linux or Visual Basic. That's because those environments use terms like "package" and "component" differently than UML does. In UML, for example, a package is a collection of related classes. In Linux, a package is a software distribution vehicle. If Fowler and Scott had explained when UML-specific words and phrases differ in meaning from other software-development contexts, the book would have been a better teaching aid.

"UML Distilled" wraps up its discussion of essential UML concepts with brief chapters on state, activity and physical diagrams. The final chapter, entitled "UML and Programming," describes a sample application, shows some UML diagrams and then shows Java code that implements the application's design. This is excellent—but why leave that to the end? An up-front introduction of a complex application would have neatly framed the entire book's contents.

Other than those quibbles, "UML Distilled" is a good first reference for experienced developers or development managers who understand object-oriented design and want a quick way to get their arms around UML. Nobody should expect to read this slim book and then start diagramming his or her enterprise's latest mission-critical application; for that, one would need to study "The Unified Modeling Language User Guide" and the "UML Reference Manual," to say the least. But thanks to Fowler and Scott, it's easy to learn what UML is all about, and be able to make heads or tails out of many UML diagrams. ▮

"UML Distilled, Second Edition." Martin Fowler with Kendall Scott, Addison-Wesley, 2000. Trade paper. 185 pages. $29.95.

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Ted Bahr, Publisher

CORRECTION

The URL for Sequoia Software Corp. is www.sequoiasoftware.com. It was reported incorrectly in an article in the May 1 edition.

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Will Shifts in Computing Cut Out The Middleman?

Time-to-market, application integration threaten traditional ideas of middleware

BY LISA MORGAN

Middleware is one of the defining technologies that has enabled the continual evolution of computing paradigms. Yet, the definition of middleware itself always has been somewhat elusive. And the enterprise application integration craze isn't helping to clarify anything. The industry, it appears, is more confused than ever.

Middleware still is the glue that resides somewhere between applications and the underlying network. It still is doing all the traditional things such as linking disparate platforms together, but more important to e-business, it's enabling e-commerce systems that link to customer-relationship management (CRM) and enterprise resource planning (ERP) systems.

One of the reasons a definition of middleware continues to elude vendors and industry pundits is that middleware functionality sometimes overlaps with operating systems and applications themselves. Regrettably, vendors don't fall into neat categories either. There is a broad range of middleware products, services and methodologies, among them messaging-oriented middleware (MOM), CORBA, Enterprise JavaBeans (EJBs), Object Management Group Inc.'s Unified Modeling Language (UML) and now EAI.

Some messaging-oriented middleware products, such as IBM Corp.'s MQSeries and PeerLogic Inc.'s PIPES, continue to weather industry changes, despite paradigm shifts and evolutionary nomenclature. MQSeries now supports 23 operating systems, for example, while continuing to provide robust management and security services. Similarly, PIPES has moved beyond simple messaging and message queuing to support a wide range of technologies, including CORBA, Java and higher-level EAI capabilities.

Middleware made distributed and client/server computing possible. Now the big news is e-business. In either case, the purpose is to enable ubiquity that solves business problems through technology.

MOM AND CORBA COMING TOGETHER

The religious wars between traditional types of middleware—OMG's Component Object Request Brokering Architecture (CORBA) specification and the broader concept of MOM in particular—are becoming moot. In fact, the technologies are beginning to share attributes. CORBA now has queuing capabilities, and many MOM implementations support request brokering.

"What you have now are integration middleware or MOM, and component brokers like CORBA and DCOM," said Peter Fischer, technical co-chair of the Business Integration Group (BIG), formerly known as the International Middleware Association and, prior to that, as the Message Oriented Middleware Association. Fischer also serves as director of technical services at Quantum Enterprise Solutions Inc. "We're seeing a mixture of middleware technologies in application servers such as IBM's Transaction Server that now support CORBA and Java."

Fischer said the biggest benefit of message brokering is asynchronous communication and that integrated solutions require time independencies. Even though CORBA is a synchronous technology, OMG now supports deferred synchronous communications that specify messages over objects.

"CORBA has been used as a legacy wrapper," said Fischer. "In a host transaction, for example, if you wanted to add a service like a Unix platform, you'd wrap it with CORBA. CORBA is very well-architected."

Michael Guttman, chief technical officer at Genesis Development Corp. (www.gendev.com), agreed, saying that CORBA's original architecture was focused at the request level but was more structured and flexible than remote procedure calls (RPCs) or MOM.

CORBA and MOM are mature solutions that have been evolving under the guidance of OMG and BIG. Over the past five years, the landscape has shifted from a debate about RPCs, CORBA and MOM to higher-level discussions about EAI, component models and modeling languages.

"There is confusion regarding CORBA," said Guttman. "There's more CORBA out there but a lot of interest in Enterprise JavaBeans. Both are moving toward the same model. CORBA services

► continued on page 24

'NEVER BEFORE HAS THERE BEEN A BIGGER

PeerLogic Inc., one of the original message-oriented middleware companies, is the provider of PIPES, real-time messaging technology that has evolved significantly over the years. Jon Brody, vice president of marketing at PeerLogic (www.peerlogic.com), admits that if PIPES hadn't evolved, it might be competing head-on with Windows 2000 today.

SD Times: Does the inclusion of middleware functionality in an operating system make you nervous as a middleware vendor?

Jon Brody: No, I'm not threatened. For one thing, many of the business functions are independent of the OS. Vendors don't choose OSes for middleware.

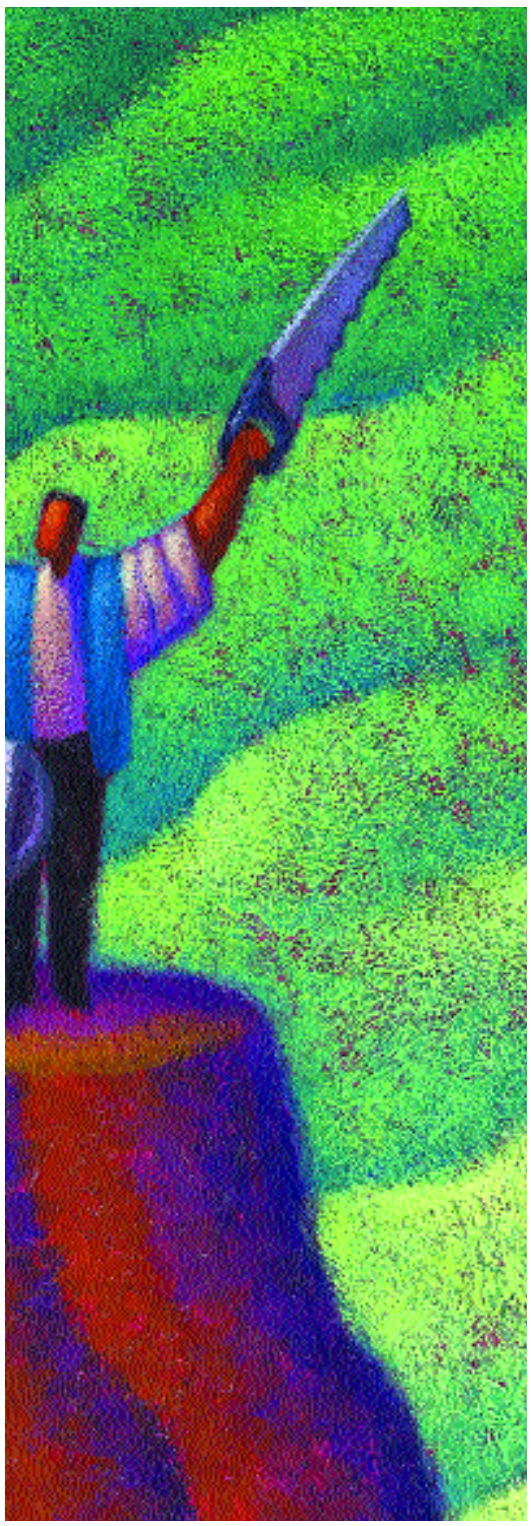
The best thing about middleware companies is they are designed to go away. Operating-system vendors are moving up the stack, but it hasn't completely happened. No vendor has been wrapped into an OS yet.

My question is, why wasn't MSMQ [Microsoft Message Queuing] bundled sooner?

So, you're saying middleware is evolving. What is your opinion of the evolution?

Middleware has always been the stuff that emerges from technology and business perspectives. It used to make more productive use of technology. It has gone through five stages.

[The first was] what Grace Hopper did for computing. She made language available. It was the first middleware, a base programming language that gave rise to other languages.



MIDDLEWARE INTEGRATES INTO OPERATING SYSTEMS

BY LISA MORGAN

Microsoft Corp. used the release of Windows 2000 Server to integrate its Microsoft Message Queuing, Microsoft Transaction Server and COM+ technologies with the operating system. This rolling of middleware into the operating system clearly helps Microsoft position Windows as a more viable enterprise platform. But what does that mean for middleware vendors? If this trend continues, will stand-alone middleware soon be part of software history?

"Microsoft is always a threat," said Bill Reedy, vice president of business integration for IBM Corp.'s software group, which sells the competing MQSeries message-queuing middleware. "But the world is not all Windows 2000."

Indeed. However, other operating systems like Solaris and Linux also include some middleware functionality. The truth is, basic middleware functionality is a commodity and vendors are heading to higher ground.

These days, basic simple message queuing isn't an innovation; it's a commodity. However, as the industry has moved from distributed computing to client computing to multitier e-business structures, business requirements have changed and so has the underlying IT infrastructure. Middleware has been evolving along with everything else.

"The bar for middleware functionality has been raised," said Peter Fischer, technical co-chair of the Business Integration Group (formerly the International Middleware Association) and director of technical services for technology research company Quantum Enterprise Solutions Inc. "In the beginning, IBM's MQSeries was expensive, but it connected disparate systems. What was once a vanguard technology is now a commodity. That's why middleware vendors are moving beyond basic connectivity to value-added processing."

According to Fischer, the middleware functionality included in operating systems to date is missing a lot of pieces, such as intelligent routing, naming services, formatting, and publish-and-subscribe. Windows 2000 offers the last, as well as Microsoft Transaction Server, which Fischer does consider a threat.

"MTS is a concern," he said. "What was once Tuxedo or a monitoring product is now part of the operating system; however it's limited by the operating system."

Juan Casanova, director of product marketing for Level 8 Systems Inc. (www.level8.com), said that operating systems aren't a threat to his company, whose Geneva Integration Suite includes enterprise messaging functionality.

"The lower forms of middleware became a commodity," he said. "The platform vendors like Sun, with Enterprise JavaBeans, are taking the commodity functionality and making it part of the platform. Middleware has to evolve with it."

In Casanova's opinion, Microsoft Corp. has drawn very clear lines around partnerships and that by including Microsoft Message Queuing (MSMQ) and Microsoft Transaction Server (MTS), it creates an opportunity for middleware vendors to provide value in other areas.

"Application integration to Windows is critical for Microsoft," said Casanova. "That is, if you want to run enterprise, mission-critical apps."

IBM's Reedy doubts that operating-system providers like Microsoft can keep pace with the middleware vendors when it comes to middle-layer functionality.

"Customers live in a heterogeneous world, and legacy applications don't just go away," he said. "Customers need to rapidly respond to market dynamics, reassembling legacy components like tying together Web applications with ERP [enterprise resource planning] and CRM [customer-relationship management]. To do that, you need components or MOM [messaging-oriented middleware]."

Michael Guttman, chief technical officer at component development consulting company Genesis Development Corp. (www.gendev.com), has a more radical view of middleware in relation to operating systems.

"Operating systems themselves are middleware because they provide common services," said Guttman. "The only difference between operating systems and middleware is that most middleware is specifically designed to broker between platforms. The main function of an operating system is to support a more homogeneous platform."

He agreed that middleware is becoming more sophisticated, saying that the original purpose of middleware was to provide cross-platform connectivity. Early versions of MOM ran on more than one platform, for example. MOM didn't take on the semantics of messages or their structure; it only provided a messaging format.

As enterprise message queuing becomes a commodity, the application challenge becomes more complex, according to Level 8's Casanova, which is why EAI is taking center stage.

"The middleware market is evolving into higher-level tools," said Casanova. "Real middleware has moved to EAI. We've added an abstraction layer above middleware due to the different types. The lower-level middleware wars are dead. The new battleground is EAI." ▮

EVOLUTION'

An Interview With PeerLogic's Jon Brody

The second wave was interactive computing that used transaction processing software. It made instant computing easier.

The third was rudimentary data integration where the POS back-end needed to exchange data. That's where file exchange middleware came in.

The fourth was network transparency, which people called distributed computing. It allowed computers to talk to one another.

The most recent is process integration, which is where we are now—tying together all kinds of systems and software to make e-business happen.

Is middleware slowly evolving, or is something more dramatic going on?

Never before has there been a bigger evolution. The Internet—coupled with a frenzy to take business advantage of it—is driving the need for scalable, rapidly deployable solutions. In the past, companies used batch operations. By contrast, middleware allows businesses to leverage IT investments like legacy applications, packaged applications and exotic technology like wireless Web solutions and network appliances.

Can you explain some of the advantages of middleware today?

Middleware has always been a productivity tool, but now it's more abstract and intelligent. The language constructs are easier, and so are the network constructs.

It's one thing to move an order from A to B, but quite another to understand the history of transactions. E-business is a violent mixture of liberating technology where you have to think out of the box to make fundamental changes.

Aren't you afraid that what you consider leading-edge technology today might be commoditized into a value-added feature of an operating system some day?

An operating system can't anticipate middleware necessarily. Nimble third parties can better deliver tools and processes that are relevant to current business trends.

Middleware is more abstract and intelligent, said Brody.

How are the trends affecting PeerLogic?

PeerLogic was one of the founding members of the Message Oriented Middleware Association, and since that time, we've learned how to make things scale.

Now we're enabling people to build sophisticated programs for business without the underlying programs getting in the way. We're doing some unbelievable things.

PeerLogic is known for PIPES, but you've been acquiring a lot of technology recently. Why?

We want to provide an end-to-end EAI solution. In addition to PIPES, we have a transaction engine, a CORBA ORB [object request broker], a visual development environment and a directory.

EAI is hard to do. People who do it need to understand business and technology. That's why you need an end-to-end e-business solution.

–Lisa Morgan

MIDDLEMAN

◂ continued from page 22

are moving toward packaging and EJB packaging is moving toward services. They will be the same class of middleware three years or so from now."

What apparently hasn't changed is the underlying proposition. Guttman asserted that MOM remains the best solution for linking application systems that are time-sensitive. Conversely, CORBA is better for environments that require online transaction processing where there are synchronous dependencies.

"MOM is moving to the component model to support more sophisticated applications where events and work-flow systems are converging," said Guttman. "Work flow is concerned about moving from simple transactions to more sophisticated applications. [Business-to-business e-commerce] represents very complex transactions and work flow."

Faced with time-to-market concerns, developers are clamoring for more abstract tools that allow them to get the job done faster.

"Everything is morphing together," said Bill Reedy, vice president of business integration for IBM's software group. "There's Java messaging service and messaging beans, SOAP [Simple Object Access Protocol], XML and COM objects. You need the abstraction because you want to be able to route data without changing the underlying applications."

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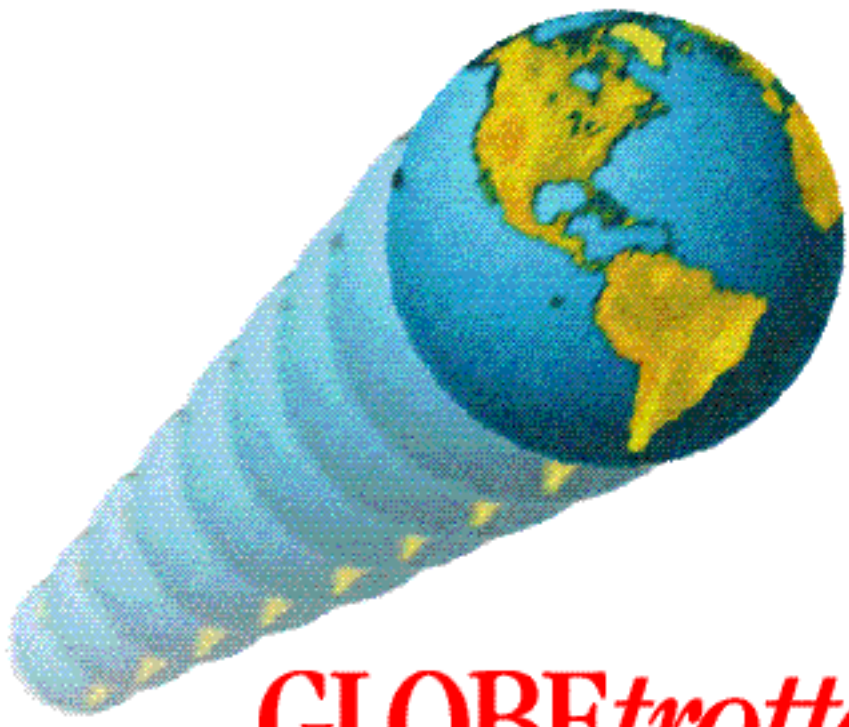

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TIME-TO-MARKET

It's no surprise that abstraction and component models are becoming popular when companies are trying to transform themselves into global e-businesses in as little as 90 days. Point-to-point solutions aren't enough.

"The CORBA component model used the container approach, similar to Enterprise JavaBeans. In the old model, the standard focused a request service called 'Service Through Request Structure,' but it was too laborious," said Guttman. "That's why the newer solutions are more abstract."

In other words, middleware companies are now expected to deliver more than just interoperability. They also need to speed time-to-market, which requires more sophisticated kinds of middleware.

Guttman said OMG's Unified Modeling Language is a step in the right direction because it allows developers to construct a model and map it to Enterprise JavaBeans or the CORBA Components Model.

"Interfaces are what middleware vendors are really selling," he said. "You're selling connectivity, systems integration and results in a structured and organized way."

EAI

Enterprise application integration is a notion every corporate development team can relate to conceptually, if not in terms of actual products. The race is on to integrate applications so that information systems can be used more strategically—like tying an ERP system into an e-commerce system to strategically manage purchasing, for example.

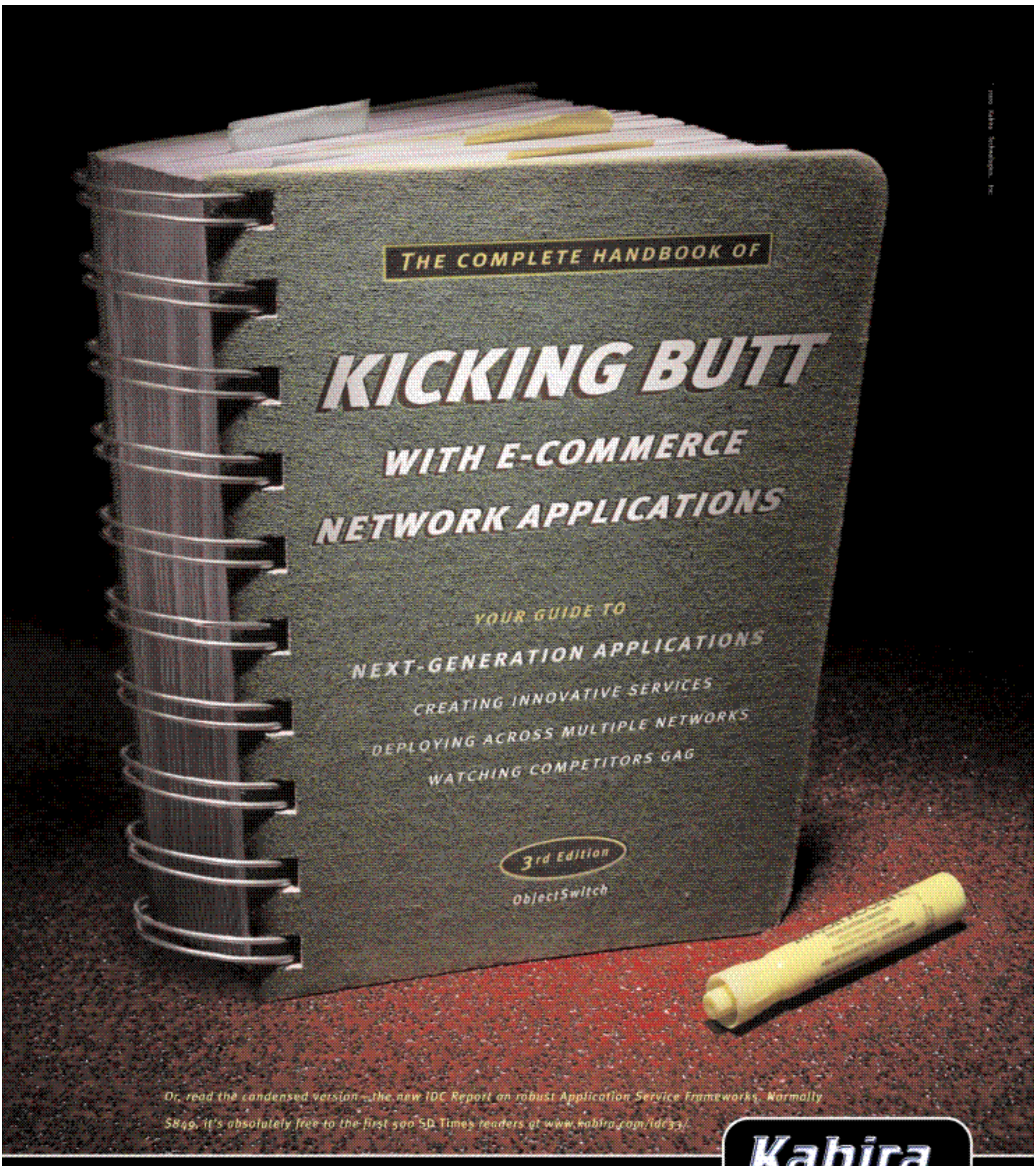
EAI ties together both custom and packaged applications, like those from SAP AG, PeopleSoft Inc. and Siebel Systems Inc. In addition to messaging and queuing (which MOM provides), EAI offers sophisticated work-flow-related capabilities such as publish-and-subscribe, data translation and process management.

There seems to be a consensus among industry observers and vendors about what EAI *does*. What it *is* is another story.

Some say EAI comprises all other middleware components. Others say EAI is missing certain features found in other types of middleware. Some use the terms "EAI" and "middleware" synonymously.

If nothing else, EAI is clearly adding to the confusion about middleware definitions, and is somewhat confusing in itself. It is an evolutionary step forward into 21st century buzzwords, if not func-

▸ continued on page 27



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MIDDLEMAN

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tionality. What EAI has going for it is a sexy killer app called B-to-B e-commerce and higher-level functionality than traditional middleware.

Jon Brody, vice president of marketing at PeerLogic (www.peerlogic.com), joked about EAI positioning but remains serious about its importance.

"B-to-B is basically the same driver as B-to-C. If you do one right, you get the other free," he said. "The key is quickly integrating systems so you can get to market fast. That's the point of EAI."

The Hurwitz Group Inc. (www.hurwitz.com), a technology research company, predicts that EAI will evolve into "a fundamental model for all corporate computing" where all applications will be designed to notify others of events via middleware.

EAI does comprise middleware functionality, regardless of what you want to call it. For example, OMG's Fischer said that messages and message queuing are being used for EAI message brokering because it provides abstraction and formatting.

"Without brokering, messaging between applications must be formatted for each pair of applications," he said. "By contrast, using brokering, data can be mapped to formats so an application can send messages to and receive messages from any number of apps, which supports the publish-and-subscribe model."

DIRTY LITTLE SECRET

Five years ago, remote procedure call-based middleware was hot, but now it's not, as many vendors argue that RPCs are point-to-point solutions that are too cumbersome for today's dynamic IT environment.

"The problem with RPC is it links segments of applications together. Users need more flexibility," said Genesis' Guttman. "MOM is doing well because it's a mature technology and customers are already familiar with it. Vendors are taking transaction monitoring and middleware and adding the component model. IBM is doing this and so is BEA."

He said the traditional five types of middleware—RPCs, database middleware, transaction processing, object-oriented middleware and message-oriented middleware—are yielding to pressure for higher value.

OMG's Fischer said RPCs are still around but living under an assumed name.

"RPCs provide a simple service, but it's the underlying technology in the middleware industry—it's just renamed," he said. "RPCs are the industry's dirty little secret. Enterprise JavaBeans are similar to RPCs. They use ACLs [access control lists] for authorization based on RPC and are synchronous in nature."

In short, middleware is evolving in both name and function. Some middleware functionality is included in operating systems and even applications such as relational databases.

Middleware is evolving because business requirements and technologies are also changing. Perhaps the most significant change in the past couple of years is one of abstraction that moves middleware beyond point-to-point connectivity to interface abstraction.

The definitions remain elusive. ▮

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SilverStream Updates Java Object Broker

Looking for an Object Request Broker? SilverStream Software Inc. has just updated its Java-based ORB to version 3.0, which adds support for the latest CORBA standard and Sun's Java 2 Enterprise Edition specification, as well as other new and emerging middleware protocols.

According to the company, jBroker 3.0 is fully CORBA 2.3 compliant, and includes support for Java Portable Object Adapter (POA) mapping, Remote Method Invocation (RMI) over the Internet Inter-ORB Protocol (IIOP), Interoperable Name Service, Objects by Value and IIOP over Secure Sockets Layer (SSL).

SilverStream is offering jBroker 3 in three editions.

jBroker Lite, says the company, is a small-footprint client ORB used to develop simple applications and as the client run-time environment for servers developed using the jBroker Developer; it can be downloaded free of charge from the SilverStream Web site (www.silverstream.com).

jBroker Developer, priced at $1,000, is a Java ORB designed for developing servers and server applications. It also includes a scaled-down ORB run-time executable for simple test deployments.

jBroker Server is a deployment ORB for applications created using the jBroker Developer. It's priced at $2,000 per CPU.

According to SilverStream, jBroker 3.0 runs on AIX, HP-UX, Linux, Solaris and Windows NT/2000. It's also included with SilverStream's Application Server. ▮

XML Continues Forward March

The Extensible Markup Language (XML) continues its march forward, thanks to broad standards organizations like the W3C and specialized groups like the American Institute of Certified Public Accountants (AICPA).

The W3C's XForms initiative is being developed by the W3C's HTML working group, which released the first public working draft of part of the specification in late April. XForms, according to W3C documents, aims to ease the transition of the Web from HTML to XML.

The AICPA is taking on a more vertical aspect of XML: the use of the standard to transfer data related to corporate financial reporting. Its specification, XBRL (Extensible Business Reporting Language), is described as a freely available XML-based framework that provides the financial community with a standards-based method to prepare, publish in a variety of formats, reliably extract and automatically exchange financial statements of publicly held companies and the information they contain.

According to the AICPA, XBRL will not require additional financial disclosure from companies to outside audiences. Previously, XBRL was known as XFRML, the Extensive Financial Reporting Markup Language; the project was renamed in mid-April. Currently, XBRL is in the "request for comment" stage, said the organization.

Numerous financial, software and consulting organizations, including all the major accounting firms, have publicly supported the draft XBRL specification, which is available from www.xfrml.org/TR/Default.htm. A sample implementation of the specification can also be viewed from the site. ▮

TESTMYBEANS GETS SERIOUS MAKEOVER

RSW Software Inc. is releasing two products—EJB-test and e-Test—that it claims provide the first testing solution for the life cycle of an application.

RSW is a wholly owned subsidiary of Teradyne Corp., which in February made available the Enterprise JavaBean (EJB) test tool TestMyBeans.com. According to Steve Caplow, director of business development at RSW (www.rswsoftware.com), the TestMyBeans identity was an interim one. "We have a serious product, so we gave it a serious name," he said.

The all-Java EJB-test 2.0 is the first load and functional test solution for Enterprise JavaBeans, Caplow said. It runs on most platforms and has been optimized for BEA System's WebLogic and IBM's WebSphere. Caplow said discussions are taking place with other application server suppliers to use the product.

The e-Test suite, which runs on Windows platforms, has been upgraded as version 4.2, offering the ability to perform functional and load testing of Java applets, Caplow said. He pointed out the release adds support for client-side Java, enhanced Web-based reporting and expanded server-side statistics, and that it has been improved to support all foreign languages.

A unique capability of the reporting feature, Caplow said, is visual scripting that not only records paths but records objects as well.

Available now, pricing for e-Test suite begins at $4,995. The price for EJB-test begins at $20,000. ▮

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"RoboHELP will end up saving at least 6 months of manhours over the planned 18-month lifecycle of our project."

However, this is definitely not the case! Studies show that 80% of end users use the Help system and printed documentation when learning a new application, making the Help and documentation critical to overall usability.

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RoboHELP's powerful functionality makes creating a full-featured Help system fast and easy. In fact, it's used by developers at companies like Symantec, Intuit, Adobe Systems, Hewlett Packard, General Motors, Johnson & Johnson, American Express and many more organizations of all sizes.

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Safelite Reveals How with RoboHELP

Safelite AutoGlass Corporation, America's largest supplier of auto glass replacement and repair services, chose RoboHELP to create their HTML Help.

"In half the time it took to develop a Help file with Microsoft's HTML Help Workshop, RoboHELP enabled us to convert the file, spruce it up with extensions, and make it more visually appealing," said Gerald Mindek, product development analyst at Safelite.

"RoboHELP enables our designers to learn and begin Help creation more quickly than with any other products we have seen."

The first reason Safelite chose RoboHELP was because of its capabilities. "RoboHELP has such great flexibility when it comes to creating and designing Help files. RoboHELP's single source feature and HTML Help generation enabled us to be less concerned about what format a Help file should be in," he added.

"If we need to create HTML Help or printed documentation, but the current Help is in WinHelp, this is not a problem thanks to RoboHELP's single source features. Secondly, the interface provided by RoboHELP to create and design Help files is impeccable. RoboHELP enables our designers to learn and begin Help creation more quickly than with any other products we have seen. The availability of commands with keystrokes and in menus is great, the organization is intuitive, and RoboHELP's own Help file is very informative," Mindek said.

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NO PROCRASTINATION ON MIGRATION

I hate moving. Mine is a nesting nature, and a none too tidy one at that. The concept of organizing that nest, packing it into boxes and transporting it to another locale is high on my list of Things to Always Procrastinate About. But, the old lease is up, the first house deal is closed, and no amount of moaning and groaning will keep the movers from showing up.

Naturally, I'm leading you toward a parallel in the development arena. Your applications are your own happy nest, and moving them to new platforms is an onerous but sometimes unavoidable task. Any number of developers are in this boat right now. Windows NT is being phased out; Windows 2000 and DNA are being phased in. You can moan and you can groan, but it's going to happen.

Fortunately, Microsoft is easing this moving pain with a reception committee of sorts in the form of the Windows 2000 Developer Readiness Kit, which is a welcome resource—as long as you're working primarily in Visual Studio. Ostensibly, the Readiness Kit's CD-ROM is for those folks who really needed Visual Studio 7. Microsoft's positioning the CD this way made me initially believe it would contain some kind of beta of this new release, or at least some update files that would increase Visual Studio 6's functionality in some way. No such luck.

But even though this disc won't provide any tangible help in the form of fresh executables, it's a valuable collection of technical documentation that will let developers start planning application migration now, so the learning and implementation curve won't be so vicious later on.

Sounds good, right? Frankly, I was disappointed. The fact that Visual Studio 7's timing was off was bad enough—expected on some level, but bad enough nonetheless. Now I get a CD-ROM that seems intended to give me something to chew on while Redmond gets its act together to finish its software. I do not use the verb "chew" lightly because that really seems to be at least part of the intent here.

WINDOWS WATCH

OLIVER RIST

Yes, the disc is stuffed with technical articles, but it's organized in such a way as to almost force you to spend copious amounts of time sifting through all this stuff. And not only are you presented with reams of information on the disc itself, but it also contains links to online information that will probably be updated as an ongoing process. That's a lot of sifting, and while I love having reams of technical documents in my problem-solving arsenal, part of me wants Microsoft to break down this stuff into some more easily digested—and fundamental—parts.

To this end, I was pointed toward a number of resources on the CD-ROM that every future Windows 2000 developer really should check out. First, the "Application Specification for Windows 2000." This document was created along with a number of third-party app developers and is a ground-level description of the basic look-and-feel building blocks that every Windows 2000 application should contain. Admittedly, this is somewhat similar to Windows 98/NT, but there are still tangible differences. And aside from making sure that your app doesn't look like the odd man out among its peers, this document is critical if you're looking to conform to the Windows 2000 logo specification. Microsoft breaks the Application Specification out into two basic forms (one for local desktop applications and another for distributed applications) and organizes the whole thing as a series of documents that are even backed up by a couple of videos.

Another important document is the "Windows 2000 Compatibility Guide," which is not a hardware compatibility guide as the name might indicate. This document is a detailed account of backend architectural changes required to make sure your application can survive reliably in the Windows 2000 operating environment. It covers not only changes resulting from the operating system, but also new installation steps and stability requirements. Fortunately, Microsoft saw fit to break the guide out into several articles rather than one gargantuan document.

Finally, you'll also find guides to building applications for Windows 2000, one for C++ developers and another for Visual Basic enthusiasts. They include not only information on how to take advantage of new operating-system features in Windows 2000, but also a number of tantalizing teasers about what will be available in Visual Studio 7. In addition, they contain some great stuff on COM+ under Windows 2000—enough so that I may revise my opinion of that technology. There is even a separate guide to developing with COM+.

All these documents are backed by online seminars that are composed of audio sessions combined with PowerPoint presentations. These cover everything from the new Visual Studio Installer to new support programs, integrated development environment features, OnNow and a host of other features. Frankly, it's no substitute for a working copy of Visual Studio 7, and it could certainly be delivered in a more accessible fashion, but as long as we're sitting around waiting in any case, it's better than nothing. ▮

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THE NEW AGE

While viewed as excessive, the recent gyrations in the stock market are a good measure of the status of the new economy. Wall Street generally gets the story right, while the spectators who condemn its machinations and its appearance of excesses generally get it wrong.

For the past year, dot-coms have soared on the prospect that they would be the vanguard of the new economy: the new engines of growth. Wall Street believed this just as fervently as you and I did. When it finally dawned on us collectively that the use of the Web/Internet sales channel conferred no special "in" to companies that were going up against established brick-and-mortar vendors, Wall Street pulled back and reassessed the situation. And like those analysts, so should we. After all, let us recall, Wall Street represents the sum total of all the thinking done by investors.

But more than the rise and fall of the dot-coms—which I believe is a significant development—I would like to look at what is happening in our industry, software, insofar as it distinguishes the new from the old.

The lead story, without a doubt, is the fall of Microsoft. A cursory examination ascribes this to the antitrust litigation, but this is a glib analysis of a far more fundamental issue.

The Internet and the wireless revolution have begun making the PC a rather peculiar investment. Users—you and me—have come to see that PCs generally perform a few predictable functions: word processing, spreadsheets, Internet access and e-mail, and games.

MIDDLEWARE WATCH

ANDREW BINSTOCK

None of these functions, you'll note, requires a Pentium III cranking at 600MHz, or 128MB of RAM, or 18GB of disk space. Small compact laptops are just fine for most of these applications. And more often than not, the value created by these PCs comes from their connection to a network.

As a client, the PCs attain their greatest value—in fact it is the server that confers the value to the PC, not the other way around. As Sun Microsystems has long trumpeted, "The network is the computer." And by extension, Internet access confers a second level of value to the PC.

SINGLE FOCUS

Microsoft has missed all this because of its single-minded focus on the desktop, as if the desktop were still a hallowed island to which the waves of IT could be found lapping. As a result, the company saw the Web phenomenon only in terms of the browser—the desktop component. It viewed networking as an afterthought. Likewise, it viewed non-desktop systems as renegade PCs—hence the excessively slow rollout of operating systems that supported laptops properly, and the thrice-repeated rollout of handheld PCs.

Windows CE is a desktop operating system posing as, well, a desktop operating system. Let's not even get into the Java fiasco. Microsoft is being punished for neglecting what was happening in the market—servers, portables, wireless.

By the same token, a company that has deeply understood what the market was telling it is Oracle. The server story needs no explanation. But let's not forget that Oracle's Larry Ellison was one of the early quixotic advocates of the thin-client PCs. His company also embraced Java early and often. And most important, it customized its products for the Internet. And where lighter-footprint versions of its database were needed, Oracle designed the needed products. So with the obvious exception of wireless, wherever Microsoft has stumbled, Oracle has succeeded.

Like Microsoft, Oracle likes to play hardball. But Oracle has enjoyed beating its competition on merit or better sales efficiency, rather than by allegedly illegal tactics.

Like Gates, Larry Ellison tends to view the world one way and brings his company to align with that view. However, more than Gates, he is capable of changing when market needs dictate. For example, a few months ago Ellison swore emphatically that application service providers (ASPs) would never be able to lease Oracle databases—an obvious threat to Oracle revenue streams. But when he saw that this position was untenable, he quietly starting selling leases to ASPs.

The new economy—server-based, Web-oriented, wireless—has been rewarded by Wall Street, even if the dot-coms fell like Icarus. In fact, investors lifted Oracle prices fivefold while halving Microsoft shares—sufficient for Ellison to pass Gates as the richest high-tech CEO on the planet. But a more telling sign that we are moving out from the old PC-centric era of computing came on May 8, when the industry standard, *PC Week*, became *eWeek*. And so, it begins… ▮

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A NEW BROWSER? SO WHAT?

We have reached a new era in Web browser development, when Netscape releases a new version and few software developers care. How times have changed!

Back in the old days of the Web, say 1997 or so, a new browser version was a big event. Remember when we could finally develop Web pages incorporating style sheets, tables and frames? (Maybe we were better off before frames, one could argue.) A whole new world of Web applications would be ushered in, not to mention a whole new series of "Learn HTML in *X* Days for Dummies" books to cover the latest features and describe the needed command syntax to add to our Web pages. Press articles galore, reviews in all of the major trade publications, and thousands of Web developers would begin downloading the software to figure out what to do.

That was then. Last month, Netscape's preview of its version 6 Web browser was greeted with none of this hoopla. What happened?

Maybe it was because Netscape set expectations so high with its Gecko open-source project but didn't deliver any actual product based on this technology for so long. Or maybe it was because Netscape browsers are no longer in the desktop majority, having lost that accolade to Microsoft's Internet Explorer (IE) some time ago.

Maybe it was because the 4.0 versions of both the Netscape and Microsoft browsers had so many incompatible enhancements that many developers opted for supporting neither set of new features on their sites. Maybe it was because version 6 implements features that have been available for some time in IE.

These are all good reasons. But for software developers, the real answer can be found if we look back a few years. Truth be told, most developers stopped caring about any new browser versions back in 1998. The version 4.0 browsers from Netscape and Microsoft were good enough for most users, and most developers didn't want to deal with learning new commands every few months and updating their Web sites to take advantage of these new features. For most of us, 1998 was when the Web moved from a toy and experimental playground to a real production environment. And as befitting any production environment, we don't want to make unnecessary changes without a lot of testing and careful planning.

I say this, even though Microsoft has been our worst enemy when it comes to keeping our browsing software constant. Microsoft slipstreams changes into the various bits and pieces of its Internet operating system/applications constantly, and trying to track down what precise version your users are running can be maddening. I had to have someone send me a screen shot of the "About" screens for IE, Outlook Express and Outlook before I could track down what they were running and try to debug their problem. Outlook Express is particularly egregious in determining the precise version; it lists versions for more than a dozen DLLs, and they're not all the same. And you have no control over this versioning issue; you have to live with whatever Microsoft puts in its current download and hope your own Web applications won't break.

Many of us left the innovation for the server side of things, assuming a certain minimalist set of features for our visitors' browsers. It was safer to build Web sites this way, too.

So perhaps we are all a bit jaded when it comes to hearing about a new and improved browser version. While there are many developers who are willing to contribute to Netscape's open-source efforts, most of corporate IT staff and end users don't want the hassles of doing a daily download of a tool that's essential to our workdays. Netscape's version 6 comes with plenty of new features, to be sure. But these features do nothing to advance the look and feel of the Web. None of them offer compelling benefits for developers, I'm sorry to say.

I'm sorry because I was really rooting for Netscape with this version. After years of being firmly in Netscape's camp, I switched last year from Navigator to IE mainly because it just ran better—not out of any love for Microsoft. Plus, I liked the integration of IE with Windows 98, Justice Department rulings to the contrary. And ironically, IE crashed less frequently than any Netscape software I ever tried.

Deep down, I was hoping that eventually Netscape would get things right and I would return. However, they blew it. Browsers aren't important anymore—it is the content that you can deliver without relying on specific browser versions to carry the day. ■

David Strom is president of David Strom Inc. and editor of the Web Informant *newsletter. Reach him at david@strom.com.*

FOUR ROLES FOR LINUX

Open-source development has existed throughout the computer age, starting with the very first computers. In fact, detailed algorithms for Turing machines were published before the first practical computers were built. So you could say that open-source development predates the existence of the computer.

Memories are short in the software business. Open-source development's distinguished history may be of interest to archaeologists, but those of us building solutions now don't associate the term "open source" with computing's early days. For all practical purposes, when we refer to open-source computing we mean Linux.

That's not fair or accurate, of course. This Internet-enabled world of ours would not work without open-source applications like Apache, Sendmail and scores of others—many of which are more mature and generally useful than Linux has so far shown itself to be. Not to mention BSD, which has everything Linux has and plenty more…but which hasn't proved its worth with a string of flashy IPOs. No, it's not fair. But it's reality. For now, for the popular press and the public at large and even for most programmers, *open source* is a synonym for *Linux*.

WHAT WE MEAN WHEN WE SAY LINUX

That little equation disposed of with a bit of lexicographic algebra, we are left with a new problem: When people refer to the success of Linux, what exactly do they mean?

The more you ponder this question, the less straightforward it seems. That's because Linux is a player in multiple areas of computing.

Linux is like Windows in that respect. But Microsoft has naming conventions that serve as a road map to its "Windows everywhere" intentions. There's Windows 98 on the desktop; Windows NT Server for servers; Windows CE (or whatever they're calling it this week) for non-PC devices. It's all very clear.

Linux runs on all those platforms, too. Consistent with the open-source movement's characteristic anarchy, however, there is no set of naming conventions. On all those platforms, Linux is simply called *Linux*.

FOUR DISTINCT MARKETS

When you hear someone talk about Linux's chances, it's important to agree on which realm you're talking about.

For example, Linux is often used as the operating system for Web servers. Teamed up with its first killer app, Apache Web Server, Linux powers 40 percent to 65 percent of all sites on the Web, depending on whose market research you believe. There is no reason to doubt Linux's success in this application space.

Once Linux gets its foot in the door through a company's Web site, developers and system administrators naturally begin to wonder if it could be an alternative to NT Server, Solaris or AIX for general-purpose servers in the IT department. Linux seems to have the right stuff in this market. However, some tools are not available. Development tools lack the rapid application development (RAD) environments, software components and class libraries that make life easier for corporate developers. Documentation and training are hit-and-miss. In the end, Linux's degree of success will be determined by the availability and quality of third-party support and NT-quality tools, not the low cost or feature set of the operating system.

A third application area for Linux is in the Internet appliance market, also known as the embedded market or the post-PC market. Already, manufacturers have demonstrated substantive consumer benefits to putting powerful computers in refrigerators, home security systems, PDAs, automobiles and more. Increasingly, these devices are being hooked up to the Internet. Manufacturers are turning to Linux as an operating system that can be tuned for use on a specific non-PC platform (because the source is available), which lives within budget constraints, and which offers superior Internet connectivity. In my opinion, this is the most promising application area for Linux in the long run. If you'd like a glimpse into this fascinating corner of computing, check out www.linuxdevices.com, an embedded-Linux portal.

Finally, there's the desktop. This is the gold ring that many users and most journalists imagine as the ultimate prize in the operating-system derby. Could Linux displace Windows as a platform for general-purpose desktop computing?

Technically, the answer is yes. Linux is not as ready to capture the desktop today as OS/2, BSD, AIX and Solaris are—and those operating systems, combined, don't generate enough sales to pay Bill Gates' mortgage—but IPOs have thrown a lot of money into the Linux market. Linux could be morphed into a desktop alternative to Windows… especially if the government's continuing antitrust litigation distracts Microsoft management from its famously single-minded focus on Windows.

To succeed on the desktop, Linux needs more commercial polish, Windows-level ease of installation and use, RAD tools to make development simple for average programmers, better peripheral support and widely available desktop productivity apps. All of the major distributors are positioned to take advantage of Linux's success on the desktop if it happens to come about; of them all, only Corel seems to be pursuing the desktop as its primary goal. If Linux succeeds on the desktop, you'll have Corel to thank for it. ■

J.D. Hildebrand is the former editor of such publications as Computer Language, Unix Review *and* Windows Tech Journal. *Reach him at jdh@sdtimes.com.*

PLEASE PROCEED CALMLY TO NEAREST SHELTER

Fallout from the Nasdaq's April/May meltdown can be observed far beyond per-share prices and market caps. The economy, which had been racing unchecked for the past nine years, has spotted a deer in its headlights and hit the brakes.

Let's start with Linux. The operating system, which has enjoyed increased use on servers, has been poised to challenge Windows on the desktop. Developers said all the platform needs is a good set of tools. Corel Corp., scorched by Microsoft Corp. when Word was bundled as preloaded software, decided to rerelease its product line for Linux. In February, it moved to take over Inprise Corp., noted builder of development tools, to strengthen its toehold in the Linux market.

MONEY WATCH

DAVID RUBINSTEIN

Then, the bottom fell out of the market. Corel's stock price plunged. A deal that was valued at $1.07 billion in February was worth only about $250 million in mid-May.

So now, Inprise's second-largest shareholder, Robert Coates of Dallas, has filed a legal complaint in a Delaware court to stop the merger, claiming Inprise was "duped" into the deal. For its part, Corel has filed papers with the SEC saying the company could run out of cash in the next three months if the deal does not go through.

As a result, Inprise has delayed filing regulatory papers related to the merger and is negotiating with Corel to get an updated fairness opinion to protect shareholders. A spokesman at Inprise said market conditions are not an escape clause for this type of deal, and that falling share prices are a concern but not a variable. Speaking under conditions of anonymity, he said Inprise still is working under the assumption that an agreement is in place, and will do so right up until the time there is not agreement.

SECURITY IS JOB ONE

Meanwhile, an old term is rearing up in the new economy: layoff. Linuxcare Inc., a developer of services for Linux users that had pulled the plug on an IPO due to unfavorable market conditions, is letting go an undisclosed number of employees (rumored to be about 25 percent of the workforce of more than 110) to save money while its venture firm reportedly shops the company. The problem there, of course, is that with falling stock prices and sharply reduced market capitalizations, the money for takeovers and buyouts just isn't as prevalent. It is no longer enough to say "Linux" and expect money to drop from the sky.

And, it seems, profitability no longer is a guarantee of market strength. Recent earning reports by Sun Microsystems, Cisco Systems, BMC Software and others that exceeded expectations were not rewarded with a run-up in share price. This will surely have a chilling effect on investment, research and development, because if you can't count on favorable earnings to give your market capitalization a boost, you're going to be real careful about relinquishing cash or stock on a high-tech flyer.

Of course, all is not lost. In spite of Microsoft's continued bargaining with the Justice Department about its fate, many market analysts have maintained a "buy" recommendation. This, even as the stock founders at around $68 per share, down from $112 in early March and off 34 percent since Feb. 1.

And Sequoia Software Inc. is bucking the trend by proceeding with the release of 4.2 million shares of stock valued at $8 per share. Last year, the company doubled its revenues to $8.4 million. But things are not as they were three months ago, let alone last year.

Many companies remain bullish for the near term, expecting the Nasdaq to establish a new bottom and continue what they believe is its inexorable march forward. Many investors, on the other hand, aren't so sure. They've taken a lot of cash out of the market, as attested by weakening trading volumes. While they haven't found anything better yet, they haven't been willing to take the leap of faith necessitated by current conditions, and are sitting on their stacks on the sidelines.

This general unease regarding the state of the economy leads to reduced spending. So does losing your job, or even the fear of losing it. When that happens, one of the first things to be cut back is spending on luxury items, such as personal computers. This will slow the adoption rate of Linux on the desktop, which will slow the development of Linux desktop applications, which will slow the need for Linux development tools, which could slow research and development. This will force companies to refocus on their core, fundamental strengths and dampen the free-wheeling investment patterns of the recent past.

And the only one smiling is Alan Greenspan. ■

David Rubinstein is executive editor of SD Times.

ON THE INSIDE

Declining stock prices have led to a flurry of insider activity, with many corporate officers executing Form 144 filings—a requirement before selling stocks or options. There is no requirement, though, that the sales actually be transacted, and the fluctuations in the market will determine who completes the sales and who does not.

At Red Hat Inc., where the stock price fell from a 52-week high of $151 per share to $24, there were 19 Form 144 filings from April 24 to April 28, totaling 1.5 million shares. At Rational Software Inc., CEO Michael Devlin filed to sell 100,000 shares, and board chairman Paul Levy filed to sell 50,000 shares. Allaire Corp. chairman of the board Joseph Allaire filed May 11 to sell 140,000 shares, following up his sale of 180,000 shares in February. He still holds roughly 1.5 million shares. President David J. Orfao filed May 8 to sell another 36,000 shares on top of the 62,774 he sold in February.

Actual sales took place at BMC Software Inc., where chief financial officer William Austin sold 13,000 shares at $42.88 per share. Senior vice president M. Brinkley Morse sold 60,000 shares at $39.45 per share. At BEA Systems Inc., e-commerce integration division president Barbara J. Britton sold 17,000 shares at $77 per share on March 30.

STOCK WATCH

$2 BILLION-PLUS

Company	Symbol	Close 5/12	Market Cap. (billions)	Shares Out (millions)
Microsoft	MSFT	68 3/4	357.80	5,177.00
Oracle	ORCL	73 3/8	208.30	2,847.00
Sun Microsystems	SUNW	81 1/8	128.70	1,747.00
SAP	SAP	46 7/16	34.13	1,255.00
Computer Associates	CA	49	26.56	542.00
BEA Systems	BEAS	44 3/8	14.06	123.00
BMC Software	BMCS	43	10.85	244.00
Citrix	CTXS	52 3/16	9.61	179.20
Rational Software	RATL	73 3/8	6.62	86.00
PeopleSoft	PSFT	13 3/16	3.80	274.08
CompuWare	CPWR	10 1/2	3.79	360.50
Symantec	SYMC	57 1/2	3.42	59.12
Red Hat	RHAT	21 7/16	3.26	149.00
Network Associates	NETA	23 3/8	3.26	139.30
Cognos	COGN	33	2.81	42.68
Entrust	ENTU	46 1/2	2.71	53.02
RSA Security	RSAS	54	2.15	39.77
Sybase	SYBS	23 3/8	2.10	81.53

$2 BILLION - $500 MILLION

Company	Symbol	Close 5/12	Market Cap. (millions)	Shares Out (millions)
Entrust	ENTU	47 9/16	2,770	53.02
Sybase	SYBS	23 5/16	2,100	81.77
Informix	IFMX	9 1/32	1,870	201.30
Allaire	ALLR	42 1/2	1,140	26.19
Legato Systems	LGTOE	12 3/8	1,050	84.98
Iona Technologies	IONA	52 1/8	1,030	19.45
Serena	SRNA	22 9/16	886	25.42
Cysive	CYSV	30	832	11.39
SilverStream	SSSW	30 7/8	625	82.50
Brio Technologies	BRIO	20 3/4	572	27.54
Axent Technologies	AXNT	18 3/4	540	28.00

UNDER $500 MILLION

Company	Symbol	Close 5/12	Market Cap. (millions)	Shares Out (millions)
Open Market	OMKT	10 9/16	487.0	46.15
Saga Systems	AGS	16 3/4	479.0	28.93
Ilog	ILOG	32 3/4	472.0	82.50
Baan	BAANF	2 1/8	447.0	214.50
Merimba	MRBA	18 1/2	431.0	23.08
Interleaf	LEAF	31	419.0	13.51
Digital River	DRIV	18 13/16	409.0	20.74
Rainbow Technologies	RNBO	29 5/8	361.2	11.46
Merant	MRNT	12 1/8	347.0	29.86
Inprise	INPR	5 5/8	343.8	57.93
Persistence	PRSW	16 3/4	324.3	19.12
Map Information	MAPS	32	279.1	8.72
SCO	SCOC	7 3/8	260.4	35.30
Viador	VIAD	14 1/4	244.4	16.46
Unify	UNFY	13 1/4	243.7	18.39
Excelon	EXLN	8	234.8	28.49
Be	BEOS	6 13/32	228.2	34.40
StarBase	SBAS	4 3/4	200.2	42.15
Aladdin	ALDN	16 7/16	186.8	11.36
Centura Software	CNTR	4 9/16	176.0	35.42
EarthWeb	EWBX	14 13/16	151.6	9.76
ISG International	CDSW	6 5/16	79.2	12.55
Fatbrain.com	FATB	4 1/2	58.3	11.42
Rogue Wave	RWAV	5 1/8	53.7	10.48
Gensym	GNSM	4 1/2	28.1	6.16
Programmer's Paradise	PROG	3 1/4	17.0	16.90

JDOM

◂ continued from page 1

What to do? The open-source JDOM Project, authored by Jason Hunter and Brett McLaughlin and available for download at both www.jdom.org and the O'Reilly Network (www.oreillynet.com), promises to alleviate the usability problems associated with DOM while eliminating the callback sequences in SAX to speed up and create efficiencies in developing XML documents in Java.

JDOM isn't just an object model; it's also an API for reading, writing and manipulating XML, said McLaughlin. "It provides an alternative to both DOM and SAX. It is a superset of them." He explained the differences between the two models as extreme and wholly responsible for the quagmire Java programmers currently find themselves in when writing XML applications. "SAX is only for reading; developers can't write or mutate a document or mutate XML."

According to McLaughlin, in processing documents using the SAX model, code must be written that is accessed for answers to callbacks that may occur during processing. The callbacks will request information about events that occur during processing, such as how to proceed when encountering specific tags.

But SAX is "very fast, because it doesn't hold an entire document in memory," McLaughlin said. "It parses and fires off these request events, so [it] is a lightweight application."

He said because Java programmers have difficulty grasping and working the sequential callback method, "everyone sort of jumped over to DOM, the other extreme." He said that DOM shows a whole document, keeping the entire thing in memory. "DOM lays the foundation for building up an entire document and traversing it like a tree, walking the nodes to check what each one is: a text node, an element node, an attribute node."

McLaughlin said that DOM is easier to use than SAX, but can consume a lot of memory. "As a memory issue, all these arbitrary nodes float around that are not optimized for Java." Also, he said, "If you want to take an XML document and transform it into a PDF [file], it would be virtually impossible because of the size of the DOM file."

According to McLaughlin, Java developers don't need to know either DOM or SAX programming in order to use JDOM. "Instead of forcing Java programmers to learn a new language, JDOM lets programmers leverage what they know, such as getting Java collections back." Another benefit is that, like SAX, JDOM doesn't consume run-time memory.

JDOM further speeds Java/XML programming by uncoupling the building of the document from its manipulation. "In DOM you build documents from existing XML files, and as long as you manipulate the document and trash it, you're still dealing with actual input and output streams and constructs," he said. But in JDOM, "if you want to build a document, when you are finished building, JDOM is going to discard all the processes and memory used to get the document, and we're not going to add run time as you add an element to the underlying file."

He said developers could input from SAX and output to DOM, adding that "everything is separate so you don't have to deal with any other operations." ▮

JAVA

◂ continued from page 1

explained, by deploying Java optional packages.

Other improvements in J2SE for enterprise interoperability include client-side ability to take advantage of LDAP directories, and CORBA support enhancements for IIOP that allow access to back-end systems, Connell said.

The J2SE also features support for common X509 digital certificates and RSA-compliant digital signatures, and provides multiple monitor support for developers.

J2SE is the base platform for Sun's Java deployment, said Connell. By comparison, Micro Edition is a subset intended for use in small devices; Enterprise Edition is a superset of J2SE that has been widely adopted for application servers, Connell said. The J2SE run-time environment, and the SDK version 1.3, are available for free download at http://java.sun.com/j2se/1.3.

IBM FIRST TO EMBRACE JAVA 1.3 TECHNOLOGY

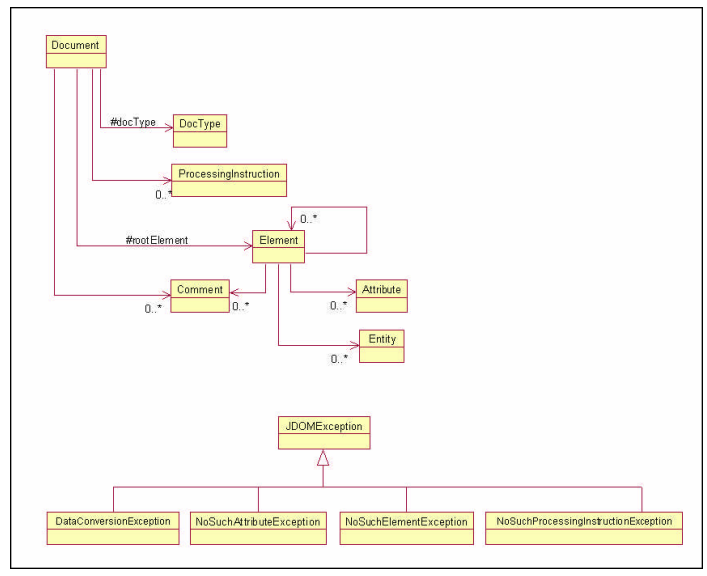
IBM Corp. this month will make available four Java Virtual Machines that support J2SE 1.3, the company announced. JVMs for AIX, Linux, OS/390 and Windows are the first of nine that IBM plans to release. JVMs for OS/400 and OS/2 will be ready shortly after the first release, the company said, followed by three more for Intel's Itanium processor later this year.

The Itanium releases will be the first Java 2 JVMs for that processor running Windows 2000, Linux and AIX/Monterey, IBM's future delivery of AIX on the Intel IA-64 systems.

"Being the first to offer a broad line of production-level 1.3 JVMs to the market underscores IBM's commitment to delivering industry-leading, fully compliant Java technology," said Rod Smith, vice president of Java software at IBM.

Preview JVMs for AIX, Linux and OS/390 can be downloaded from www.alphaWorks.ibm.com.

IBM is also working on enhancements to its JVM technologies to address the specific high-performance requirements of short-lived, fast, transactional applications. This will allow Java to be used effectively in place of traditional languages in high-transactional environments. The company plans to add these new technologies first to OS/390 and then expand the new capability to the Windows, AIX/Monterey and Linux platforms. ▮



A condensed UML diagram for Java Document Object Model 1.0 beta 3.

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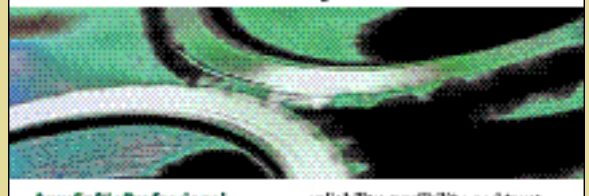
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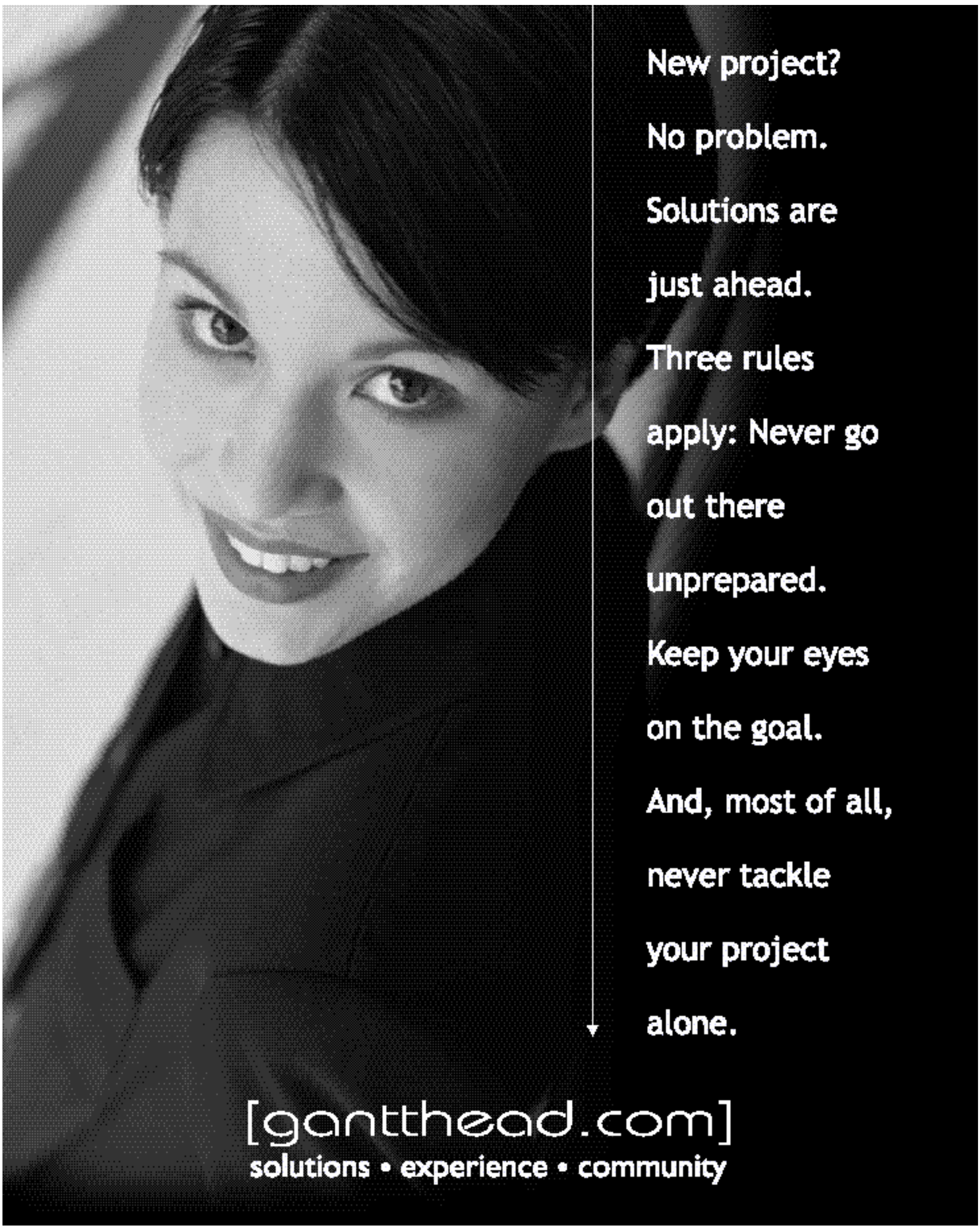
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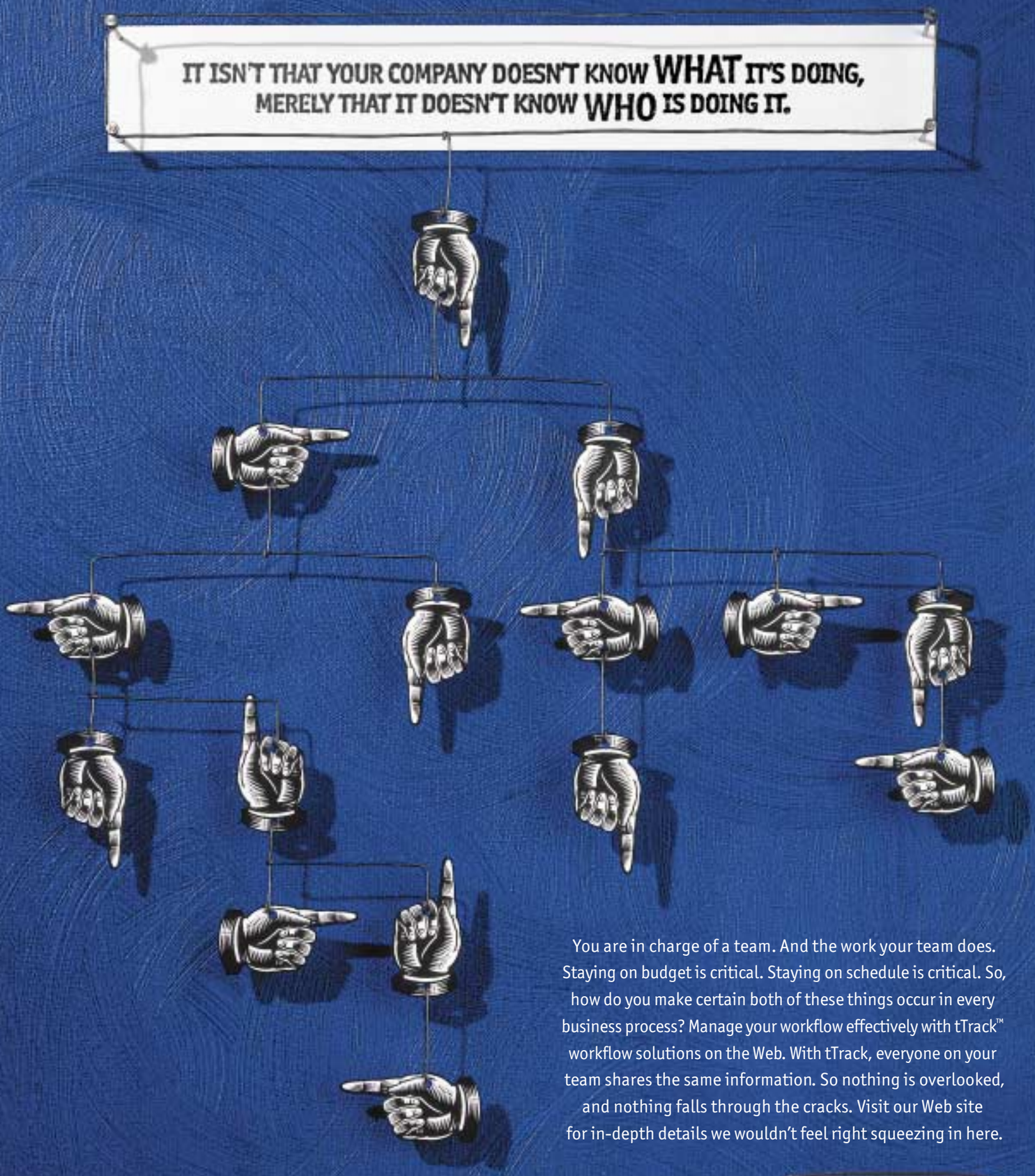

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